The TROPICAL AGRICULTURIST MONTHLY.

Vol. XIX. COLOMBO, NOVEMBER 1st, 1899. No. 5.

REMEDIAL MEASURES AND INSECTICIDES.

By E. E. Green, Government Entomologist.

(*Continued from page 231.*)

BEFORE quitting the subject of general remedial measures and entering upon detailed descriptions of particular processes, something should be said upon the important question of the introduction of 'natural enemies' of the *Coccidæ*. The same circumstances that make an imported pest so exceptionally daugerous act in our favour in the importation of beneficial insects. Just as the absence of its established natural enemies enables an insect pest to multiply without hindrance, so the introduction of a beneficial insect without its own natural checks will also permit of its rapid increase as long as an ample supply of congenial food is obtainable. When the food supply begins to fail, which means when the pest has been mastered by its imported enemies, then they will both decline together. There need be little fear that, when the food supply has been exhausted, the imported insect will itself become a pest. A predatory insect, by which is understood one that preys upon other insects or animals, will seldom, if ever, alter its diet and become a vegetarian.

It is noticeable that an insect seldom assumes any importance in its original home, unless through some accidental or artificial interference with the balance of nature in that part. (For instance, it has been asserted that the widespread destruction of moles in England has resulted in a marked increase of damage to pasture land from the grubs of the 'cockchafer' beetles and 'crane-flies,' upon which the moles fed.) Consequently, if we are to obtain any benefit from the use of natural agents, we must endeavour to reproduce the conditions prevailing in the country where the insect in question is known to occur, though without attracting notice as a pest. Or, if the original home of the injurious insect is unknown, we may reasonably hope for good results from the introduction of an insect that is found to prey upon some allied pest in another country.

The most important natural enemies of the scale insects, or, at least, those that have attracted most attention, belong to a family of small beetles popularly known as lady-birds.' The complete success attending the introduction of an Australian lady bird (*Vedalia cardinalis*) into California, where it cleared the orange orchards of the destructive 'Fluted-scale' (*Icerya purchasi*) has led to numerous other experiments of a similar kind. These experiments have not always been successful. There must, of necessity, be many failures. We are still only in the experimental stage of the work. Even when the beneficial insects has been successfully established in a country, it is by no means certain that it will thrive. There may be climatic or other conditions against it. In that case, all we can do is to try another insect. Occasional, or even repeated, failures should not discourage the repetition of the attempt. The value of a single success will far outweigh the cost of many failures. In the course of such experiments the causes of failure will in time be ascertained, and improved methods be employed. The freezing method recommended by Mr. Kœbele seems to be rather an uncertain one, and has led to many disappointments. I am inclined to hope for more satisfactory results from the employment of 'Wardian cases,' as suggested to me by Mr. Lounsbury. In these the insects will remain active and be supplied with food. There are certain obvious dangers connected with this method, such as the possible introduction of the insect pest upon which the 'lady-birds' have been supported during the voyage. For this reason the business should be conducted under the supervision of trained entomolongists only. In choosing the food supply, an insect that already occurs in the country to which the lady-birds are consigned should, if possible, be selected.* But, under any circumstances, the imported beetles should not be liberated immediately, but should be transferred to fresh breeding cages and supplied with local food, and the cage in which

* In a recent consignment of 'lady-birds' received from the Cape of Good Hope, the cochineal insect (*Coccus cacti*) was very judiciously chosen for the purpose. This insect is practically confined to the 'Prickly Pear' cactus, and is therefore not liable to become a pest.

they arrived should at once be throughly disinfected. In sending stocks by Wardian case, the larvæ of the beetles may with advantage be included. These will complete their transformations during transit, and are more likely to survive the voyage than the adult insects.

There are other natural enemies of the Coccidæ that may some day be advantageously employed in the same way. Amongst the two-winged flies *(Diptera)* we find the *Lestophonus iceryæ*, which attacks the 'Fluted-scale.' Nearly every species of scale insect is subject to minute internal parasites belonging to the wasp family *(Hymenoptera)*. The family *Neuroptera* supplies the 'Lace-wing flies,' the larvæ of which are known as 'Aphis-lions,' from the voracious way in which they feed upon Aphides and scale insects. Even the butterflies and moths *(Lepidoptera)* provide a few coccid-eating species, such as the caterpillars of the butterfly *Spalgis epius* and of several months of the genus *Eublemma*. The 'lady-birds' are included in the family *Coleoptera*.

Besides natural enemies belonging to the animal kingdom, scale insects are subject to diseases belonging to the vegetable world. There are several parasitic fungi that render great assistance in reducing the numbers of our Coccid-pests. In Ceylon, during the wetter months of the year, the 'green bug' *(Lecaniumviride)* dies off to a large extent, attacked by a greyish mould which, after killing the insect, spreads outwards as a delicate fringe of interlacing whitish threads. A bright orange-coloured fungus (Septoria ? sp.,) is useful in checking the increase of *(Fiorinia fiorinia* and *Chionaspis biclavis* on the tea plant, and *Aspidiotus aurantii* on orange trees. A very similar fungus *(Sphærostilbe coccophila)* that attacks *Aspidiotus perniciosus* in Florida (U. S. A.) has been the subject of some very interesting experiments to test the possibility of communicating the disease to previously healthy colonies of the insect. Dr. L. O. Howard gives the following particulars of the experiments:*—

'An interesting and important development of the past two season's work has been the identification and study of the parasitic fungus, *Sphærostilbe coccophila*. Professor Rolfs, of the Florida Station, has devoted a bulletin largely to the consideration of this fungus, which, as previously stated, seems to be prevalent throughout the Southern States. He has shown experimentally that the fungus may be transferred to trees affected with San Jose scale, and the disease produced among the scales. His process was to inoculate acid bread with pure cultures of the fungus, and three weeks later the application was made in the following way:—A piece of the bread about an inch square was placed in cold water, and shaken until the bread was broken up and the spores distributed in the water. This water was then applied to the scaly tree by means of a sponge or cloth, or sprayed on. The applications were made in Midsummer of 1896, and observations were made as to the results late in February, 1897. Four of his experiments resulted successfully, and three unsuccessfully, while in the eighth experiment the result was doubtful on account of the tree having died between the times of treatment and inspection. Twigs from Florida containing Sans Jose scales, infested by the fungus, were sent to Mr. Horace Roberts, at Fellowship, N. J., about the middle of June. On September 25th Dr. Smith found the fungus upon almost, if not quite, all of the trees on which twigs had been tied. A number of instances have come to our observation of the death of the scale in a wholesale manner from the spontaneous work of this disease, or from some other cause. For example, we received scale-infested cuttings in January, 1897, from an orchard which was said to have been freed from scales by this fungus disease. Careful examination showed that upon one cutting, out of 183 scales, but four were living; on a second cutting, out of 723, but two were living; on a third cutting, out of 579, but twenty-eight were living, thirty-four living scales out of 1485—a mortality rate of 97·7.'

I have, myself, repeatedly succeeded in disseminating the disease affecting *Lecanium viride* by tying branches with diseased insects on to trees on which the bug had hitherto remained quite healthy.

There are several methods by which spores of these parasitic fungi may be disseminted. As in the last-mentioned experiment, they may sometimes be communicated by merely transferring affected branches to the neighbourhood of the healthy insects. In such cases the spores are carried by the wind to their destination. But in some of these fungi the spores are gelatinous and agglutinated, in which case the wind would fail to disperse them. Fungi of this kind may be crushed up in water and used as a spray; or artificial cultures may be made and mixed with water, to be used in the same way. In the ordinary course of nature these gelatinous spores are probably carried from tree to tree on the feet of birds.

General List of Substances and Processes Employed in the Treatment of Scale Insects.

The Gas Treatment.

Hydrocyanic acid gas is the material employed in this process. It is generated by the admixture of cyanide of potassium, sulphuric acid and water. For the details of treatment I cannot do better than quote *in extenso* from the admirable paper on 'Gas Treatment for Scale Insects,' compiled by Mr. C. P. Lounsbury from his personal experience as Government Entomologist at the Cape of Good Hope. The process described was principally employed against *Aspidiotus aurantii*—an insect that appears to be distinctly on the increase in Ceylon. I may add that I have followed Mr. Lounsbury's directions in my own experiments with most satisfactory results.

'*Generation of the Gas.*—Hydrocyanic acid gas is generated by the action of sulphuric acid on potassium cyanide in the presence of water. The required quantities of the cyanide and water are first placed in the generating vessel, the cyanide being broken into small pieces not above the size of lump sugar. The tree is then covered with the tent or sheet and vessel slipped under almost to the base of the tree; reaching in, the operator then adds the acid, pouring it slowly into the vessel so as to avoid its splashing an thus burning his hand or the cloth. He immediately withdraws and the men shovel a little soil on the edges of the cloth all around, to more throughly prevent the escape of the gas.

'The rapidity of the evolution of the gas depends largely upon the size of the pieces of cyanide. If these are like powder, the reaction is violent and immediate; but, if in lumps, the reaction takes place more slowly and continues for a minute or longer. The slow reaction is desired, partly because less injury results to the foliage immediately above the vessel. But the lumps must not be too large, for then the reaction is liable to be imperfect owing to a black coating (carbon ?) forming over the lumps and preventing further decomposition by the acid. The water should not be added too soon or part of the cyanide becomes dissolved and gives a violent reaction. The residue which remains in the dishes is buried and; the dishes are washed in clean water before being again used.

'*Time necessary for Treatment.*—The cover is left over the tree for thirty minutes in the case of small trees, and forty-five in the case of those over twelve feet in height. At the expiration of this period the generating vessel is removed, and the residue buried in the soil.

'A number of trees are fumigated together, the endeavour being to treat as many at a time as can be covered and uncovered during the period of exposure. In this way the men are kept continuously busy, the time for the removal of the first tent arriving by the time that the last tree is covered.

---

* *Bulletin*, No. 12. (New Series.) U. S. Department of Agriculture (Division of Entomology).

'*Absence of Sunlight necessary.*—The originators of the fumigation process observed that the gas was most efficacious, and that less injury resulted to the foliage when the operations were performed at night than when they were carried on in sunlight. It is said that chemical changes are produced in the gas by the action of sunlight, and that the resulting gases are more injurious to the plant life and less to animal than hydrocyanic acid gas. Whether or not these theories are correct is of small practical importance, for the foliage of a tree will suffer serious injury if the tree is left covered with an air-tight oiled tent for half an hour in sunlight, without the gas being present. Having ascertained this fact by experience, the foreman in charge of the Board's outfit refrained from covering trees until the sun had sunk from sight on any but cool, dull days. The great majority of the trees treated have been fumigated after sunset. The ideal night for fumigating is quiet, cool, and moonlight, and without dew.'

It is evident, from the above that the period available for this process is somewhat limited. However, when only a few trees have to be treated, the hour immediately preceding nightfall will be ample for the purpose. I have personally found no ill effects following the operation when performed on dull, cloudy days, when the sun is entirely obscured.

Although hydrocyanic acid gas will certainly kill every insect—and even their eggs—if used in sufficient strength and for a sufficient length of time, both the necessary strength and time will be found to vary with different species of insects, and must be made the subject of careful experiment. I find that *Orthegia insignis* is a very difficult insect to kill, and requires a double strength of gas, continued for fully three-quarters of an hour.

Mr. D. W. Coquillet, one of the first to employ this process, gives the following directions for making an air-tight tent: *—'The material commonly used in the construction of the tent is what is known as blue or brown drilling. A few persons have used ducking instead of drilling, but this is much inferior to the latter; in the ducking the threads extend only lengthwise and crosswise, whereas in the drilling they also extend diagonally—this belonging to the class of goods to which our merchants apply the term "twilled"—and for this reason the drilling is both stronger and closer in texture than the ducking.

'After the tent is sewed up it is given a coat of black paint, as it has been ascertained that tents treated in this manner last longer than those which have been simply oiled with linseed oil. Some persons mix a small quantity of soap-suds with the paint in order to render the latter more pliable when dry, and therefore less liable to crack. Instead of thus painting the tent some persons simply give it a coating of size. Sometimes a small quantity of whiting or chalk is added to this sizing, with or without the addition of lampblack. A few make use of the mucilaginous juice of the common cactus (*Opuntia Engelmanni*) for this purpose. To obtain this, the cactus leaves or stems are cut or broken up into pieces, thrown into a barrel, and covered with water after which they are allowed to soak for three or four days. The liquid portion is then drawn off, and is ready for use without further preparation. Tents which I saw that had been prepared with this substance were to all appearances as air-tight and pliable as when prepared in any other manner.'

For the oiling, Mr. Lounsbury recommends a mixture of four parts boiled linseed oil to one part turpentine. The cloth should be first well wetted with water, and the mixture spread lightly over the surface with a brush. A thin coating is found to be sufficient. Mr. Lounsbury has since informed me that he now uses, with completely satisfactory results, tents made of cloth merely shrunk in water, without any subsequent oiling. Such tents are, of course, much lighter and more easy to manipulate.

Mr. Coquillet gives the annexed table, showing the quantities of chemicals required for different-sized trees.

Height of tree.	Diameter of tree top.	Water.	Sulphuric acid.	Potassium cyanide.
Feet,	Feet.	Fluid oz	Fluid oz.	oz.
6	4	⅔	⅓	⅓
8	6	2	1	1
10	8	4½	2¼	2¼
12	10	8	4	4
12	14	16	8	8
14	10	10	5	5
14	14	19	9½	9½
16	12	16	8	8
16	16	29	14½	14½
18	14	26	13	13
20	16	36	18	18
22	18	52	26	26
24	20	66	33	33

Mr. Lounsbury, after practical experience at the Cape, publishes the following figures, from which it appears that he found smaller quantities sufficient. This is doubtless, due to difference in purity of the chemicals. Mr. Lounsbury was working with cyanide of 98 to 100 per cent. purity, while Mr. Coquillet was using cyanide of only 33 to 58 per cent. It is therefore important to know the exact amount of pure potassium cyanide in the particular brand employed.

Height.	Diameter.	Water.	Acid.	Cyanide.	Space enclosed.
Feet.	Feet.	Fluid oz.	Fluid oz.	oz.	Cubic feet.
4	3	¼	⅛	⅛	25
6	4	½	¼	¼	65
8	5	1	½	½	140
8	6	1½	¾	¾	200
10	6	2	1	1	255
10	8	3	1½	1½	435
12	8	3½	1¾	1¾	535
12	10	5½	2¾	2¾	815
14	8	4½	2¼	2¼	635
14	10	6½	3¼	3¼	970
14	12	9	4½	4½	1355
16	10	7½	3¾	3¾	1130
16	12	10½	5¼	5¼	1585
16	14	14	7	7	2105
18	12	12	6	6	1810
18	14	16	8	8	2415
18	16	20	10	10	3085
20	14	18	9	9	2720
20	16	23	11½	11½	3485
20	18	29	14½	14½	4325
22	18	32	16	16	4835
22	20	39	19½	19½	5865
24	20	43	21½	21½	6500

The gas treatment has been largely used in combating scale insects (Particularly *Aspidiotus aurantii*) on orange trees. It will be found the most effectual method for exterminating *Orthezia insignis*, or any other insect, upon individual trees.

Soap and Soapy Emulsions.

Soap by itself has considerable insecticidal properties. In fact, in many popular mixtures, it is extremely probable that the soap is the most efficacious ingredient. It acts by asphixiation, forming an impervious film over the breathing pores of the insects.

Whale-oil soaps are found to be the best for the purpose. In *Insect Life*, vol. vii. p. 369, the following conclusions are drawn from numerous experiments upon trees infested with the San Jose scale (*Aspidiotus perniciosus*) in America;—'Soap washes

* U.S. Department of Agriculture (Division of Entomology). *Bulletin*, No. 23.

particularly of whale-oil soap, have yielded the most satisfactory results; and at the rate of two pounds to the gallon, under the conditions of thorough drenching of the entire plant, with five or six days of subsequent fair weather, will destroy all the scales, whether applied in fall or in spring. The results with soap in less strength indicate that under the most favourable conditions the same result may be reached with mixtures containing only a pound and a half or more soap. The action of the soap at the rate of one pound or more to the gallon, applied in the fall, is generally to prevent blooming and fruiting the following spring, but the vigour and healthfulness of the tree are greatly increased. Applied in spring at the time of blooming, it does not injure the plant nor affect the setting of the fruit to any material extent in the case of the peach, and not at all in the case of the apple.

'The experiments, as a whole, indicate the vastly superior merit of the soap wash and its fall application. The great vigour of the plant resulting from the fall treatment more than offsets the possible failing of bloom. Owing to the impossibility of controlling weather conditions, and the practical difficulty of wetting every part of the plant, one spraying cannot often be relied on to accomplish the death of all the scales, but two conscientious drenchings may be expected to accomplish this result. These may be (1) at the time of, or shortly after, the falling of the foliage in autumn, and (2) just before blooming in spring.'

Other soaps (hard laundry soap) are efficacious, but not to the same degree.

In another of the American reports* is an instructive paper on insecticide soaps, by Mr. C. L. Marlatt, from which I take the liberty of quoting largely:—'The decided insecticide value of the so-called whale-oil (more properly fish oil) soaps, against scale insects particularly, has been fully demonstrated in the last few years in the work against the San Jose scale and has fully substantiated Professor Cornstock's early recommendation of this means of controlling scale-insect pests. The merit of these soaps is not only in their effectiveness as insect-destroyers, but from their being entirely without injurious effect on the treated plant. In this respect they are perfectly safe in the hands of any person, in contradistinction to all oily washes, which are very liable to be injurious in greater or less degree, although the injury may be insignificant or perhaps not apparent immediately, or during the first season.'........'The use of soaps is attended with certain difficulties.'........'To be satisfactory for insecticide use it must, when dissolved at the desired rate, say two pounds to the gallon of water, remain a liquid capable of being sprayed with an ordinary nozzle at an ordinary temperature. This may be determined by a very simple test, and one which should be invariably given any soap before it is accepted for spraying operations. It consists in simply dissolving a small quantity of the soap at the desired rate, and allowing it to cool.'

Many soaps solidify or become gelatinous and fenacious on cooling. These are useless for spraying purposes. The common country soap of Ceylon has this defect. I have experimented in a small way with soap mixtures; but it is difficult to obtain here a brand that combines suitability with cheapness. Such a brand is a great desideratum. I find that one of the most useful properties of the soap mixtures is to prevent the escape of the young larvæ by blocking up the natural exists, and on this account the treatment is to be very strongly recommended.

(*To be concluded*)

GESTATION OF THE ELEPHANT.

Sir, Our Burma *mahauts* invariable maintain that the period of gestation in the elephant extends to three years. It may, therefore, be of interest to put on record an observation bearing on this statement.

Forest elephants in Burma are simply hobbled and turned loose in the nearest jungle to feed, and hence, unlike the Commissariat animals, are practically in a state of nature, and breed freely.

In June 1897, one of the *mahauts* reported that his elephant had been covered by the tusker attached to the division, whilst the animals were turned out to feed. The act was observed every evening for about a week, from about the 18th to the 25th May, 1897. Neither of the animals showed signs of sexual excitement previously, though the male paid assiduous court to the female for a few days before coition was permitted. They were both at work at this period—dragging logs—and gave no trouble to their attendants. The report was noted, but, I am sorry to say, forgotten, till the 3rd November 1898, when in the evening, the elephant gave birth to a female calf.

Fortunately, that day she had only carried a light load for a short march. The baby, though so weak that it had to keep itself upright by holding on to a bamboo with its mouth, was perfectly healthy and well formed, and after a day, could stand and suckle. The period of gestation, therefore, had been a little over seventeen calendar months, or almost exactly eighteen lunar months.—C. B. S.—*Indian Forester.*

JOB'S TEARS (*COIX-LACHRYMA-JOBI*)—A USEFUL FODDER.

By F. Manson Bailey, F. L. S., Colonial Botanist.

During Lord Lamington's tour round New Guinea in May last, at almost all the places visited was seen a luxuriant growth of the grass known as Job's Tears (*Coix Lachryma-Jobi* of the botanist). The growth of the plant and the beauty of its seeds made such an impression on Lord Lamington that he requested me to take seeds of each to Queensland for cultivation, which I did; and the accompanying plate illustrates the product of a single seed sown in my garden at Spring Hill, is by no means favourable soil or situation for foddergrowing. The plant represented comprised 26 stems from 2 to 4½ feet high, leafy throughout their whole length— in fact, it is a model fodder plant, suiting the climate both North and South of the colony and from this point of view is now brought to the notice of dairy men and farmers generally. The present form seems to be of a more succulent character than that generally found in garden culture. The two kinds met with in New Guinea differed considerably in the form of the seed—The one being tear-shaped, and the other linear or oblong; both are usually of a bluish-grey colour. The stems of each, from a single plant, are numerous and very leafy. So far as I have been able to judge, the long-seeded form is of smaller growth but my seeds of this were sown later than those of the other. I may remark that I have had specimens of this grass sent to me for determination from different parts of Queensland by persons who have met with it in a naturalised state, but whether these belonged to the New Guinea forms or not I cannot say. One advantage possessed by this plant over sorghum is that it does not make so strong a root, so that when necessary to plough out to renovate the plantation it will not form so strong a resistance to the work as the varieties of sorghum. The stems are also more slender and not so coarse. In sowing the seeds, place them about 1 foot apart in rows 2 or 3 feet asunder, during the months of September and October. The plants being perennial they will last for several years without renewing. The plant may also be increased by divisions of the stool, which allows of vacancies in the plantation being filled up.

The natives of New Guinea seem only to use "Job's Tears" for ornamentation purposes, the pretty bluish grey seeds being prized for making into necklaces and decorating their weapons, &c. I could not hear of the seeds being used for food by them, yet Sir J. D

* *Bulletin*, No. 6 (New Series), U.S. Department of Agriculture (Division of Entomology).

Hooker tells us that the plant is cultivated in India for this purpose; therefore in all probability the seed of the two New Guinea forms may be put to the same use in some parts of the island. Duthie states that in Oudh (India) the plant is largely eaten by cattle, and is said to be very fattening.

THE VANILLA BEAN.

This valuable product, which is highly prized for making extracts of perfumery and in cooking, has, within the past few months become very scarce, and the price, in consequence, has advanced to three times what it formerly sold for. Nothing has ever been found to take its place in cookery, or for perfumery, and consequently the price must remain high for some years to come, as it takes three years for the plant to come into bearing, after which it continues in fruit for several years, improving from year to year, if well cared for.

A recent published statement says that the shortage of 1894 was due to a frost, which destroyed whole plantations. Then in 1895 a clash between the Indians, who occupy and cultivate the large plantations around Papantla, Mexico, the centre of this industry, and the Mexican authorities, who own the lands, resulted in the former being driven out, but not before they had succeeded in almost entirely destroying the vanilla plants as revenge. These two causes account for the shortage, as it requires three or four years before a plant will yield fruit. This shortage is much greater than is generally known. The present price of beans is $16·00 per pound, and it is not unlikely that it may advance to $18 or $20.

We have several times urged the planting of vanilla as a minor industry, as it will flourish here in almost any locality, where it has plenty of water, but is particularly adapted to the rainy sections of Hawaii. Although it requires three to four years for the vines to come into full bearing, it will then pay better than almost any other industry, that does not require much capital. Nor will it interfere with any other light work, and is particularly suited to females. In a future issue we will give some particulars regarding its cultivation and mode of curing the beans. —*Planters' Monthly*.

PARA RUBBER AND THE GOVERNMENT.

The following is the official report of a discussion on the supply of Para rubber seeds from Singapore at the U. P. A. at Selangor on Aug. 14th,—

The Chairman said that, in consequence of the attitude taken by the Singapore Government with regard to the supply of rubber seed to applicants from the Federated States, he had interviewed the Colonial Secretary in Singapore and had been told that, in booking orders for rubber seed from planters in the Native States, Mr. Ridley had acted without authority from Government, and it was the intention of the Singapore Government to repudiate his action, as all orders for seeds from the Colony must be first executed. In consequence of this it had been decided at a Committee Meeting, held on the 22nd May last, that a sub-Commitee consisting of the Chairman, Secretary and Mr. Bailey should interview the Resident-General, laying all the facts of the matter before him for consideration and asking for his advice and support. (He the Chairman) and Mr. Bailey had seen the Resident-General, who said that those applicants who held no distinct promise in writing from Mr. Ridley had only a moral claim against the Government, and he doubted whether it could be enforced, but the case of Mr. Bailey was very different and he did not see how it could be disputed. That was how the matter stood so far, but Mr. Bailey would tell them what his case was and what action he was taking.

Mr. Bailey said that early in 1897 he ordered 500,000 Para Rubber seeds from the Botanic Gardens, Singapore, and on 1st April, 1897, Mr. Ridley wrote saying he would supply him with that number as soon as he could at $10 per 1,000. As he was forming a Company to plant rubber in Selangor, he wrote officially to Mr. Ridley on 12th August, 1898, asking him what number of seeds he could supply him with from 1st September, 1898, to 1st September, 1899, as it greatly depended on the number of seeds available as to whether the Company went through or not. In repply Mr. Ridley said he would be unable to supply the complete order from the present crop, but, as he was the pioneer of the cultivation, he would guarantee that he should have half each crop of seed till his orders were filled. The represent crop of seed is expected to be 150,000 yet he is now offered only 15,000, which is a very different thing to above promise from Mr. Ridley.

The Resident General, at the interview mentioned by Mr. Carey, had stated that he had already put the matter into the hands of his lawyers.

The Chairman said he hoped the meeting would express their willingness to support Mr. Bailey in his action.

Mr. Lake asked if this expression was meant to imply that the Associatson should support the action in a momentary sense if necessary.

The Chairman said he certainly considered so, but there was not much likelihood that such help would be required.

The proposal met with the unanimous approval of the meeting.—*Singapore Free Press*.

POSSIBLE INDUSTRIES IN TRAVANCORE.

ANOTHER LAND OF PROMISE.

A correspondent writing to the *Madras Mail* urges the small capitalist to look to Travancore and take note of the possibilities that exist there fore the successful cultivation of low-country products. As an inducement he leads off with a noteworthy example of what a small man at one time actually did.

THE FOUNDATION OF ONE FORTUNE.

The late Mr. Darragh, he says, started business in Travancore a little more than a quarter of a century ago with the very slenderest capital, and confining his operations chiefly to the products of the coconut tree died an extremely wealthy man. Not long before he died he turned his attention to cotton, and opened a mill in Quilon, which is still flourishing, although the cotton has to be conveyed to it all the way from Tinnevelly. Labour, however, is so abundant and so cheap that the mill is said to be thriving concern.

ANOTHER FORTUNE GOING BEGGING.

A part from the mill industry in cotton, which is in the position of being some what overdone, it is puzzling why the enterprising European capitalist has not attempted to work coir and copra by machinery. In Travancore, with its vast output of capra and coir, the most primitive and unsatisfactory methods are still in vogue in extracting coconut oil and in cleaning and weaving the coconut fibre into rope, and it was by exporting these materials that Dr. Darragh scored such a brilliant success. The establishment of an oil mill or two with other machinery for dealing with the fibre, would make the fortune of the first person who supplied these wants. Both water-power and steam-power are available, und fuel is as cheap as it can practically be any where, where it is not to be had for the mere gathering.

WHAT A FEW SAW-MILLS COULD DO.

Again any European who turned his attention to the vast timber supplies of the State would find it paid him Timber for railway sleepers is now selected from a limited variety, viz., sal, teak, deodar, payngadu and pine. Another writer in the *Madras Mail* calculates that at least three million railway sleepers are wanted annually in India for renewal and extension work, and state that a saving of one rupee on a sleeper represented a sum of thirty lakhs of rupees saved! All this shows that only a little energy and plenty of

capital is necesary to make the timber trade—more or less stationary and languishing in the absence of enterprise—flourish and bring in to the State and to the speculator a large income.

THE HUMBLE PLANTAIN,

is also held out as a Travancore Bonanza. We quote:—It may interest some to learn that great possibilities exist in the cultivation and exportation of the plantain and its prodncts. The fruit is now largely consumed in Europe, and it ought to be a matter of no great difficulty to establish on a firm footing a trade in this product from Travancore. Plantains in their raw codition plantains preserved, plantain flour, plntain fibre, etc., shonld bring in some profit. In fact, the value of Travancore as a great fruit-producing country is lost sight of.

THE POSSIBILITIES OF THE PINE.

Pineapples, for instance, grow with the greatest luxuriance, and are to be had in the season for the ridiculously low price of three pies per pine. The fibre is said to be particularly strong and silky, and is adapted for various kinds of manufactures. *Commerce* says it is a good substitute for flax and that a certain quantity of the fibre " prepared in Singapore tested against an equal quantity of flax sustained 350 lb., while the latter could not bear more than 260 lb. " It is also said to be snbstituted for silk, and that an excellent linen is made from it.

OTHER PRODUCTS AWAITING THE CAPITALIST.

Waiving for the present all notice of pepper, ginger, and other garden produce attention, may be drawn to the vast quantities of tapioca root available, which forms the staple food of the poorer classes, with rice. Very few people have any idea that the arrowroot plant grows wild in Travancore, aud that enterprice only a needed to develop the trade in this root. There are various other substances in the shape of vegetable oils of sorts--laurel oil— gums and resins, indigo, etc., Lem n grass oil has been manufactured to some extent, bnt as it forms a good base for perfumes, essential oils and etc , greater opportunities in regard to its use might be seized. Travancore has now a European Government contractor in Mr. Mitchell, who appears to have his eyes open and when the long expected railway becomes an accomplished fact a greater number of enterprising men may give an impetus to local trade. The possibilities of paper manufactnre in a land where material, fuel, water-power and a constant demand exist was long ago recognised by the formatiou of a Joint-stock Company and the construction of a mill ou which lakhs of rupees were spent. After a time, the manufacture of paper was discontinued, for what reason is not quite apparent to the uninitiated. The plant lies idle, and the Company is moribun without any attempt being made to resuscitate the working, or wind up the affairs of the shareholders. If this letter, concludes the writer, will help to remind some energetic shareholder of his wasted money and his oppotunities, it will uot have been written in vain —*Madras Mail.*

DURBAN BOTANIC GARDENS.

A CURIOSITY, A BLACK BOY.

Mr. J. Medley Wood reports:—Since the date of my last report the weather has been exceedingly dry, only 0·91 in, having fallen at the Gardens since May 23, and during the August 0·22 in. only was registered. In consequence of this very unusual drought many of the plants in the Gardens are drooping, and flowers are exceedingly scarce. In addition to the usual routing work, which has been very heavy, some of the hands have been engaged in oiling the woodwork of the Palm-house and giving the class another coat of paint, as the coat first given has been fonnd to be too thin; this work is now nearly completed.

The plant of *Xanthorraea hastilis*, the "Grass Gum Tree," or "Black Boy," a native of New South Wales has sent up a flowering spike from the centre of the rosette of leaves. This spike is now several feet high, aud is thickly covered with hundreds of small white flowers, and is a curiosity not often seen in South Africa, a photo has been taken of it, and I suggest that it shall be reproduced in the annual report. It is to be hoped that we shall not lose the plant, which is the only one we have, and is much admired by visitors. It can hardly be less than 25 years old, and is probably more than that. [The name "Black Boy," says a correspondent to ourselves (*T.A.*,) is only applicable as regards the appearance assumed by the plant in its native habitat, the Australian prairies, where its stout trunk becomes blackened both by bush fires and by a resinons excrescence on the trunk, when seen thus in groups at a distance they have a weird appearance, which readily suggest the black aborigines. The gummy exudation from the trunk is made use of as a gum; hence the plant is also known by the name "Grass-gum tree." It belongs however, to the Lily tribe, and not to the grass-family, although its large crowns of thin, long, wiry leaves have much the appearance of grass.] One of the trees of *Aleurites triloba* has been felled for the purpose of testing the wood, the trunk to the lowest main branch measured 24 ft. with a girth at 10 ft. from the base of 6 ft.

Two cases of deaths of cattle from supposed poisoning have occurred lately on the Berea. The first I did not hear of until too late, bnt as the second case, when two valuable cows were lost, was brought to my notice in time, I visited the locality in which the cattle had been grazing, the herd boy being with me to point out the exact place. Unfortunately the whole, or almost the whole, of the underwood bad been lately cut down. I think by the Corporation gang of labourers, but after some little search I found that many plants of *Moraeairidioides* had been bitten off, and the herd-boy assured me that he had seen the cattle eating the plant, and that no other cattle had, to his knowledge, been grazing near. I am not aware that this plant has poisonous properties, but the species known here as "Tulp" or "Tulip" all belong to the genus *Moraea*. It would, I think, be advisab'e that this plant should be chemically examined. The native say that this plant is not usually eaten by cattle.

I have received from Mauritius two cases containing many valuable plants. The steamer which brought them was placed in quarantine, and the cases were taken on to East London, and returned to us from that port by another ship, but I was pleased to find that the plants had not suffered very much damage from the long detention. From Botanic Gardens of Cambridge I have received a valuable case of plants, chiefly ornamental, which arrived in excellent condition. I have also received packets of seeds as under:—Guina, 1; Kew, 1; Paris, 6; Mysore, 1; Sumatra, per Mr. Van Leenhoff, 19; Adelaide, 84; Bangalore, 1; Zomba, 1; St. Albans, 1; Mr. J. Beningfield, sweet lemon and mango; Mr. M. Matthews, bulbs.

For the Colonial Herbarium the second part, completing the first volume of "Natal Plants," is now ready and may be obtained from the booksellers, or on application at the Gardens. The first part of the second volume, which is confined to the grasses of the Colony, and will contain 25 plates and descriptions, is in the printer's hands, and will be ready in a few weeks' time; and the third volume, which will be similar to the first, is in progress. I have received parcels of dried specimens of foreign plants from South Australia, 81 specimens; Sydney, 200; Queenstown (chiefly Transvaal plants), 212; and from Mr. J. F. Quekett 16 specimens of foreign mosses; and I have sent away parcels of dried specimens of native plants as follows:—M. Evsn, O. E. Meuzel, J. H. Maiden, J. F. Duthie, Dr. J. B. Palacky, Biltmore Herbarium, Field Columbiau Museum, and to the United States National Herbarium, two parcels.—*Natal Mercury.*

THE VELVET BEAN.

So much has been heard of late of the Velvet Bean as a green dressing, &c., that the following extract from *Louisiana Planter* of 4th March, 1899, will be of interest. The plant has been imported by the Botanical Department, and has produced a fair crop of seed, but not sufficient for general distribution. During the year a section will be set aside at the experiment grounds, St. Clair, for the local trial of this Legume.

VELVET BEANS.—This valuable plant has been grown extensively in this state During the past year. Our agricultural press has been filled with accounts of its superior excellence. The plant is still on trial, but promises to become a rival to our best varieties of cow-peas, wherever it can be grown. Unfortunately it is not yet well acclimated, so far as the production of seed is concerned, since an early frost last year destroyed many immature pods. By planting very early and using some tree, house bush, or arbor upon which the vines can climb, the seeds can be matured before frost. Gradually by acclimation and selection, it is believed its cultivation can be successfully extended even north of this state. As it requires comparatively few seeds per acre, planted as usually done, in rows about four feet wide and two feet apart in the drill, it is worthy of extensive cultivation even for its enormous vines, which can be easily cured into an excellent quality of hay. It is an enormous nitrogen gatherer, as analysis elsewhere shows. The tubercles on its roots are the largest of any plant so far experimented with. Coral-like clusters of tubercles, each as large as a hen's egg have been gathered from its roots, and analysis made of them by Mr. Clarke, station chemist, at State Experiment Station, Baton Rouge, La., showed six per cent. of nitrogen. The vines may be cured into hay or turned under easily with a disc plow. In smmer old leaves are replaced by new ones and the ground, underneath the vines, becomes covered with dead leaves. The seed grow in velvety pods, which are collected into racemes, thus making them easy to gather. They are difficult to shell by hand. The seed are larger than a cow-pea, and a bushel will plant several acres.

The only work in the scientific investigation of this bean, that we have seen, is reported in Bulletin No. 35, of the Florida Experiment Station. Prof. A. A. Persons, chemist of that station, reports the following analysis of the bean, and then compares it with cow-pea.

"An analysis of the beans, not including the shells or pods, made by Professor A. A. Persons, gave the following results:—

ANALYSIS OF THE VELVET BEAN.

"Moisture at 100 degrees	11·93	per cent.
"Crude Ash	2·02	"
"Crude Protein	18 81	"
"Albuminoid Nitrogen	2·87	"
"Crude fat (either extract) ..	6·29	"
"Crude Fibre	7·45	"
"Nitrogen (free extract)	53·50	"

Calculated to a water-free basis, and compared with an analysis of the cow-pea under the same conditions, the following figures express the relative composition of the two:—

	Velvet bean.	*Cow-pea.*	
"Ash	2·20 ...	10·50	per cent.
"Protein	21·36 ...	14·30	"
"Fat	7·14 ...	2·60	"
"Fibre	8 46 ..	29·00	"
"Nitrogen (free extract)	60·75 ..	43·60	"

"The nutritive ratio of the cow-pea is about 1·3. It is impossible to assign a definite ratio to the velvet bean, for the reason that, so far as I am aware, its percentage of digestibility has never been determined. The only manner of accomplishing this is by means of practical feeding experiments with stock.

"Assuming the digestibility of this velvet bean to be equal to that of the cow-pea, it will be found that it compares quite favourably with the letter and since it grows luxuriantly in different sections of the state, and since stock are known to feed upon it with great relish, it may, perhaps, play a prominent part as a forage crop in Florida in the future.

"It is to be classed among the feed stuffs which are especially rich in nitrogen [protein substances]. A feeding stuff so rich in nitrogen should not be fed alone but in conjuction with some coarse fodder containing a much larger proportion of carbo-hydrates [starch, etc.], such, for example, as corn fodder."

This analysis, supplemented by those given elsewhere in this bulletin, will furnish all the information necessary to form a correct estimate of the value of this plant as a nitrogen gatherer. There are rumours of a poisonous principle in the beans of this plant, but judging from the above remarks, and others made in the same bulletin by Dr. Clute and Mr. Green, on orange grower, of Orlando, Fla., these rumours are not founded in fact.

The velvet beans are largely used in Florida, and, to some extent, in this state, in the orange groves, both as a fertilizer for the trees and as a destroyer of weeds and grasses. It will completely destroy Bermuda and temporarily obscures coco or nut grass (*Cyperus rotundus*). It may, perhaps, successfully cope with Johnson grass.—*Trinidad Bulletin.*

MANURIAL PLANTS FOR TEA.

To say where seed can be obtained, and the cost it is a very simple matter, but to say what to grow is quite another and larger matter. The tea is already to a large extent in possession of the land on which it is proposed to grow legumes for its benefit; it has been systematically cultivated for more or less lengthened periods. On this class of soil it is proposed to grow legumes for the purpose of organising free nitrogen for the benefit of tea. Quite a number of practical considerations crop up at this stage of the enquiry, and in order to see what is really practical for tea we must look into them.

First comes the matter of convenience—getting freely about among the tea, facility for plucking, and pruning, and so forth. Any plant that materially interferes with these operations is manifestly out of the question, and that unfortunately places a number of eligibles without the pale, such as the Lupines; unless indeed they admit of systematically cutting down, which I think they do not. But we are so much in the region of the unknownable, or more correctly the theoretical, that I would beg the reader to take much that follows here as suggestive and matter for experiment; and likewise to fail not give us the result of any experimental knowledge he may possess, as a matter of first class importance to the tea industry at this stage.

Secondly there is the question of what will and what won't grow among tea plants, and when these plants will grow and when they won't grow to any advantage. These are points that cannot be answered off-hand. Again, it is highly improbable any one legume exists that will grow freely in all tea districts; and the different soils too: these are not going to grow legumes at random. I even question whether there are not thousands of acres that will not grow legumes to any advantage to the tea because it has been discovered certain plants organize free nitrogen.

I am strongly of opinion we have not, therefore, found a universal panacea for tea, and I would beg leave to caution planters against for a moment allowing themselves to imagine they have arrived on the verge of the millennium for debilitated tea, or that in this discovery there is found a sort of universal resuscitator. I nowhere gather that the most expert scientist is prepared to say or prove that the discovery has even caused a small revolution in agriculture where its advantages can be laid hold of to the fullest extent; let alone doing anything very great for tea. I am very far from wish-

ing to decry the discovery: it is interesting and important, but some scientific discoveries get too much magnified by some, and I think this is one of them. Agriculture, in particular rotations of crops, have all, unconcious of the scientific fact, been recognizing its practical utility for a very long period, but nothing at all out of the ordinary has happened. The way of this I think is because it is not a great disoovery, but essentially a small thing. Those pre-eminently distinguished and now venerable Agricultural Chemists, Lawes and Gilbert, make it abandantly clear. In spite of all we know thus far, the *nerrick*, as it were, of nature below the surface is largely undiscovered.

However, in the matter of organizing free nitrogen from leguminous plants for tea, the time very speedily comes when it is necessary to destroy the organizers by digging them into the soil, in favour of a rotation crop, and it is not until some time after destruction, during the process of full decay that the full advantages of the free nitrogen is available and consequently in the ordinary course of things the succeeding crop gets the advantage, if ineeded that is not nature's deliberate intention. In this case, however, it is for the tea plant; it will follow then that the rotation crop must also be dug in, and this crop to be of the best advantage all round must differ from the legume. The planter will do well to have always in mind that no soil, least of all much tea soil, will go on growing leguminous plants; and further that, although they organize free nitrogen by bacteria through the nodules of the roots, the plants themselves require a different nourishment, in part including abandance of lime, and no soil, and particularly tea soil, will go on successfully growing, of all plants legumes. There must be the indispensable and advantageous rotation and theretore in this case periodic destruction of both. Your correspondent will at once see this implies periodic renewal and re-sowing, and the pertinent question comes in here. Will the exigencies of tea operations admit of the planter saving his own seed? Because if it won't, then I fear it won't pay; unless indeed, and what certainly ought to happen by perseverance, the increase of tea is such as to admit of periodic purchase of new seeds. These are practical questions planters can solve for themselves. In any case it is well to have in mind that while nitrogen is locked up in the nodules of the roots of legumes it is not very likely to he of much service to deep-rooting tea; in order to be serviceable there must be a simple system of rotation, digging in, and renewals. But I believe the fact that some legumes organize free nitrogen is by no means the sum of advantage likely to accrue from planting them for the advantage of tea. I had here intended to have made a direct quotation from Mr. Cooke (Sirocco) but unfortunately have failed to find the particular sentence I wanted. However, this, if I remember rightly, is the gist of it:—"We do not sufficiently realize how much we gain or save by making less tea." This looks very like a paradox. Now I would advance a closely allied proposition, namely, that we do not sufficiently realize how much we should gain by doing less—in the way of cultivation—more especially if the cultivation is extended over lengthened periods, and I am fully convinced from a nnmber of experiments of the great good of rest; total abandonment of cultivation, allowing nature to come in and do, as she undoubtedly does, some beneficent work. Very many planters should be sent on a tour round the world on foot or a bicycle for two years, and if the soil and tea could only speak I believe it would say Amen to the proposal very promptly.

Coming to practical suggestions for your correspondent, I would advise him to try a bushel of the ordinary field the pea-soup pea of commmerce. I feel sure as a cold weather crop, and provided the soil is not difficient in lime, this would succeed in many cases well. Then it should be allowed to fully mature its crop, and here comes the question whether he should save his seed. I think from one bushel two might be taken and all the remainder dug in. What would happen precisely, I cannot say; for Assam doubtless the hot weather would be too much for the dug in seed, but if that was not, the rains would be, I quite expect. However, it would not much matter what happened, because the seed as well as the plant would be a highly nitrogenous manure. There are very few legumes or food plants which contain so much nourishment as the pea—about 930 per cent. per 1,000 parts for the seed. This plant lays low and grows dwarf, and would not, I think interfere with the tea, and if the newly dug in seed grew, that would be an additional advantage. Again I have formed a very high opinion of some annual grasses which grow luxuriantly, but not tall, during the monsoon, are excellent fodder plants, seed freely, and die down in cold weather. There is a period when a valuable dressing of manure can be hoed in, and any amount of seed insuring a full crop another year. It is so far as is known true these grasses do not organize nitrogen in the way legumes do, but they contain a quantity, and I venture to think it may very well be that good annual grasses would prove of the greatest possible service for tea lands; any serious wash is impossible, soddened land is practically impossible. Once a year at the correct seed period the land could receive one through hoeing, no further cultivation being necessary. Of these grasses I will send yonr Dibrugurh correspondent a small packet of two kinds and ask him to be good enough to sow on the appearance of spring rains and watch their behaviour for Assam if he is satisfied he can himself increase the area a thousand fold by collecting his own seed. They have the great advantage of being non-creeping, no under ground stems—termed by Botanist Soboles—and there is no possibility of a permanent choked up soil. My very strong impression is, herein lies a good thing for tea:—A legume for the cold weather season and a good annual grass for monsoons, and only two very thorough hoeings per annum, one for the grass, one for the legume. The grass seed will abide the monsoon period withont germinating to any extent, and would not be interfered with by the leguminous crop. Some other day I may make a communication to the *Planter* on sundry grasses, as I am getting seeds of a number from widely different parts of the world, but the time has not arrived to say anything further abont them. The burden of it is, everyone should make some definite experiment in the direction of surface crop, which will protect the soil, and abolish in a very large measure cultivation, and yet forsooth it would be a kind of culture highly advantageous. When it is recognized that the tea plant is only a shrub above ground and that by artificial means and that below it has the roots of a tree; and that without manure you can neither add nor take from the soil over and above what natnre allows; and that by annual crops due in you come as close as probably it will ever pay to an immitation of nature's methods,—then I believe planters will see their current methods in the long run are vanity and vexation of spirit; and based on heavy knows what dustnr perhaps, to solely and wholly for the tea plant and not as a general principle for anything.—"Secatur Indicus," —*Planter.*

South Sea Island Papaya.—The Curator of the Government Botanic Gardens and Parks, Nilgiris, reports the successful raising of a number of plants from seed of the South Sea Island Papaya (*Carica Papaya*) and observes:—"As soon as it becomes established, it is hoped that it will prove to be a desirable addition to the list of tropical fruits grown on the lower slopes of the Nilgiris to meet the demands in the local markets." The fruit of this tree at Bangalore is much larger than that usually seen on the ordinary Papaya.—*Planting Opinion*, Sept. 30.

THE CULTIVATION OF TEA: MEASURES TO PREVENT DISEASE.

COMMON SENSE TREATMENTS, CALCULATED TO HOLD GREY AND OTHER BLIGHTS IN CHECK, COMBINED WITH PROFITS TO THE ESTATE.

I doubt not that such direct treatment as the picking-off of diseased leaves will (as calculated to defoliate bushes) soon be held as of minor importance, in the treatment of Plant Diseases, and it might, therefore, be as well to review some methods, which, though indirect, might be looked upon as far more effective, and the least that can be expected if such methods are carried out carefully, is that the increased returns from the tea treatment will cover the cost of such.

Burying Prunings.—As being the most important of such, let us first take the Burying of Prunings. Dr. Watt's remarks on this subject, are worth reading. He seems to have concluded from the result of his flying visit to Assam, etc., that prunings should not be buried for the reason that they would be likely to foster parasitic growth—(though in stating this I might add that he mainly refers to Thread Blight, a pest peculiar in that it spreads by long fibrous mycelium, has the power of living on the dead buried matter, and of afterwards resuming its parasitic life on adjacent plants)—and I do not think his remarks apply so much to grey and kindred blights. However, both he and Mr. Massee, losing sight, I am afraid, of the object for which we grow tea, recommend the burning of prunings, condemning burying. Neither mentions the use of disinfectants in connection with such operations, and yet at the same time they have a lot to say about the great value of time, etc., as fungicides. So perhaps, we who are the most interested, might be permitted to view the matter in a more practical light and look upon burying as our cheapest and most feasible means of treatment—with two great advantages over burning: (1) a saving of almost all organic matter in the prunings, and (2) prunings would not have to be carried some distance—as in burning, in most cases—to suitable open spaces. It follows that doing so would give the wind every chance to scatter spores to great distances, whereas in burying a yard would represent the greatest distance to a place of burial. Prunings can be well buried—including careful sweeping of the ground, and the cutting of deeper holes than usual—with a dose of about 500 lb. of lime per acre, at a cost of about R20; the lime added quickly decomposes the mass buried, as well as acting as an indirect manure by freeing potash, nitrogen, etc., which may be locked up in the soil, in an insoluble form. As lime could hardly be used every time a field was pruned, some substitute might be formed, in solutions like the Bordeaux Mixture; such could easily be sprayed on the collected mass by the aid of an ordinary watering can or something of that kind, the only drawback at present being the prohibitive cost of sulphate of copper, as probably about 50 lb. would be used per acre. However, where this chemical is used in large quantities, it is extremely cheap; and, no doubt, when a demand was felt here, we should be able to purchase at a figure warranting our using such past experience on estates where prunings were buried solely in the way of manuring, thus proving how valuable such operations are. Personally I have done such work on a small scale for some years with most gratifying results, and a well-known property on which this system has been carried out for some six years, stands probably today as the freest from pests and the healthiest estate in the island. Mr. Bamber, I know, is strong on prunings being buried, provided, of course, such work is done in a thorough manner, and I am sure that we shall find he will have a good deal to say on this subject in the Report he will shortly put before us.

Burning.—Now for Burning, it is unfortunate that on almost every estate there are places too steep for burying or cultivation of this nature, and I believe there is also one district where the presence of something in the nature of thread blight, prohibits the burying of prunings; on such places burning must be resorted to as about the only method of treatment available. In this operation the value of the manure created plays but an unimportant part, the ash collected from the burning of prunings from an acre of healthy tea, would give about 20 lb. of potash, 6 lb. of phosphoric acid, and about 14 lb. of lime, losing about 40 lb. of nitrogen. This would be utilized were the prunings buried and, if these prunings were left undisturbed, most of the Potash, etc. in the ash would be available for the plants' use. And looking to the difficulty of properly re-distributing the ashes, it would be necessary, when applying artificially, to almost double the usual dose, where the ash has not being returned—in order to make up for the loss of same.

Destruction of Cheddie.—Mr. Massee says, remembering the very different kinds of plants on which this fungus is known to be parasitic (speaking of Grey Blight) it is probable that it also occurs on wild plants in the vicinity of tea. If such is the case,—and there is no doubt about it—all such should be removed if possible, as the *Conidia* is carried great distances by wind and other agencies, and no amount of attention to the tea would avail if the supply of *Conidia* necessary for inoculation, were grown in the neighbourhood. Now, there are two things which might be done with cheddie, etc., with a view to using such as manure. It might be buried in large pits (accompanied with a little Basic slag or Lime to assist rapid decomposition) to be afterwards applied as a bulk manure; or cheddie grass, etc., collected, might be burnt and the ashes collected under shelter till required. This would be of value, on account of the Potash and Lime contained; the amount of these would vary very much according to the class of vegetation, but we might take an average of 10 per cent as representing the quantity of Potash in the ash.

Another class of vegetation which would come under this head are the dense masses of belts and road trees we have in our fields, with the idea of either checking wind or acting as a fuel reserve. Such trees, it seems to me, do a great deal more harm than good, and excepting in districts like Udapussellawa are quite unnecessary. We will take gums; if we look at bushes adjacent to trees of this description, we find them in a most miserable condition. This is more due to the drip from

the leaves than anything else, as gums in most cases are deeper feeders than tea and therefore do not rob the latter, so much as other trees do. Grevilleas seem harmless, but if we examine them carefully, we shall find the branches covered with scaly bug, etc., the surrounding tea getting the benefit thereof; not to mention the shade created, which is so much to the liking of injurious growths. Another system to be condemned is growing trees for fuel amongst the tea. One need but look at the tea adjacent (a few months after these trees have been felled!) to wonder whether the fuel obtained were worth the damage done.

ARTIFICIAL.—Now, a few remarks on artificial manuring. It will be found that in many cases the results of application of artificial manures are unsatisfactory; this being due to our allowing our fields to go too far before manuring, the bushes being shuck; and if we examine the roots, we will find them in a like state. The result is, they are not in a condition to assimilate the manure applied, a part of which in consequence will be lost. One must allow for this in first application and give the bush a larger dose than would be required in succeeding ones. Surely the "Times," in claiming that Mr. Bamber has reduced the cost of manuring in the island by 50 per cent, makes an absurd statement and one very uncomplimentary to the Planting Community generally. I happen to know that Mr. Bamber is probably as suprised as we are at this statement, though I also know that the "Times" gathered this information from several different men. I can only say that Mr. Bamber's coming has indeed been a God-send—*to such*—but I most certainly think that the majority—including Mr. Bamber himself—would not for a moment dream of such extraordinary cheapening in the cost of manuring being possible. Mr. Bamber recommends cheap mixtures; so do others and such mixtures were used long before he came; and as he aims at permanent benefit to the soil, how we can attempt to place any value on his system till at least a trial of two years, I cannot see. At present the greatest tribute we can pay him, is that he came at the right moment and played an important part in the upsetting of the Castor Cake and Bone Era of Conservatism.

HANKOW THE TEA MART OF CHINA.

THE TOWN AND ITS INDUSTRY.

(Specially written for the "Ceylon Observer.")

Hankow does not perhaps stand pre-eminent as a health resort, and indeed those who have faced a summer or two in that place, might look upon Colombo as a sanitarium; but as

A CENTRE OF BUSINESS ENERGY

and activity it is, for three months—May, June and July—in a unique position.

Situated about 650 miles from Shanghai, up the Yangtzse, on its right bank, it stands in the very centre of China as the mart of the China tea trade. Not that tea is the only article it trades in, but undoubtedly tea has made Hankow famous. Big businesses are done in hides, bristles, feathers and "all sorts and conditions" of other articles; but tea has made Hankow what it is.

As the month of May approaches, the return of the tea-tasters, or "Chaaszees" as they are called, is noticed in Shanghai and erelong they take ship up to Hankow. There are three principal lines of steamers up to this port, known as Ewo, Taikoo and China Merchants; and if you ask a Chinaman which he prefers, he will answer thus:—Ewo is best for the Canton man who travels up, Taikoo best for the foreigner, and China Merchants best for Mandarins. This is borne out in fact and tea-tasters generally select Taikoo.

About three days are occupied in the journey and several interesting river treaty ports are touched at *en route.* Kiukiang is reached about a day before Hankow. All teas from Kiukiang districts arrive at this port first and several houses have representatives there in order to buy earlier than others. But the bulk of the teas are shipped up to Hankow and offered on that market.

QUIETNESS REIGNS SUPREME

in Hankow when the "Chaaszee" arrives and the Bund wears a dreary and forsaken aspect; but in a day or two all is changed with the arrival of the first musters. The tea-taster buckles on his armour in the shape of his oldest clothes and the tea battle opens! A tea season is no child's play when once started and the musters arrive in a seemingly endless stream. The tea-taster in a "quick" season must be in his tea room by 5-30 a.m. and start operations forthwith, nor stay his hand (or rather tongue!) till five or six at night, barring short intervals for meals.

THE TEA-TASTER

is *not* a rigid abstainer during the season as stated in a recent "Century" article, but he perhaps takes his stimulants in rather smaller quantities and discards smoking altogether until after dinner and the day's work is over.

He proceeds on very similar lines to those in Colombo, the essential difference being the very great care necessary, and taken, compared with that in the case of Ceylon teas.

A very good-sized sample is sent round by the Broker—much larger be it noted than that allowed by the Colombo trade—and he then proceeds to become acquainted with the quality of the tea before him, using the same utensils for this purpose as in use in Ceylon. The "Century" article errs very much in its description of this phase of the subject.

If the tea suits him, he tells the Broker to forward a chest muster and thus has the useful opportunity of seeing a full half-chest of the tea before he has even made a bid for it. Should he still like it, he then makes a contract for the tea at the price agreed upon; but he has the option of returning the chest muster and making no purchase should he, on second tasting, dislike the tea. It will be realised that this is of great assistance to the tea taster in selecting suitable teas for his orders and if an error is made it is more often his own lack of judgment rather than inability to see what the tea really is from a very small sample.

If the tea taster is exacting in making his staff work, he also works very hard himself,

and requisitions Sunday as an extra twenty-four hours in which to work. His godown soon begins to wear a very animated appearance, and weighing, marking, matting and rattanning operations are constantly in process.

The "Century" article states that tea is brought to Hankow in sacks as well as half-chests and is frequently re-fired. This, however, is hardly consistent with facts. Little or no tea with any pretension to quality is so packed, only the common tea dust and siftings used in "brick"-making being brought in this fashion, and the merchant certainly does very little or no firing; as he prefers to open as few packages as possible. *Common* tea is frequently repacked from half-chests to chests, but the bulk of the tea is shipped in its original packages.

A great advantage the merchant gets in buying China tea is

A SUBSTANTIAL ALLOWANCE

in weight given by the tea-men and thus a loss in weight is impossible. This is a fact that might be seriously borne in mind by the planters of Ceylon if they wish to capture new markets, especially the Russian. As stated in a previous article, another great advantage is the large size of the break which a merchant is able to buy.

The arrival of the first Russian steamer is the sign of great activity on the Bund, hundreds and hundreds of coolies being employed in carrying tea to the cargo boats for transhipment to the big steamer. Each Chinaman will carry two half-chests slung one on each end of a bamboo pole across his shoulders and the rapidity with which he goes is a great contrast to the slow bullock cart of Ceylon. Six weeks of this feverish activity brings the "rush" to a close, but there is plenty of work for all for another two months, though carried on in a more leisurely way.

By the end of August Hankow *residents* settle down to wait for autumn and winter sport and their ordinary work; and the tea-tasters ship once more for happier and less busy climes.

HANKOW ITSELF

is flat and uninteresting, its Bund being the chief promenade for walking. In the month of July, the plains at the back are flooded and continue so for some time, and Hankow is thus practically shut in and riding operations are very much curtailed. As the new Concessions given to the French, Russians and Germans are developed, the place will grow in importance and some even go so far as to say, will rival Shanghai, if not in beauty, at least as a trading centre. Adjoining the English Concession is the densely populated city of Hankow, containing 800,000 Chinese, the majority living in indescribable hovels and filth. Its size may be judged by the fact that its principal street is over three miles in length.

The condition of life during the Great Heat must be appalling as the Chinaman knows absolutely nothing of sanitation and it is reported that thousands die during the summer from various diseases. The principle of "survival of the fittest" is undoubtedly carried into actual practice to a very large extent in such a place as this. With all this, however, the average Chinaman seems to be a contented man and they seem to have solved the question of the "happiness of the greatest number."

Opposite to Hankow on the other side of the river is Wuchang, the capital of the Province of Hupeh, whose Viceroy is

THE CELEBRATED CHANG CHIH TENG,

famed for his Western learning. Famed until he is known, when he is found to be, at bed-rock, of much the same build and character as the ordinary Mandarin. He has established arsenals, iron works, cotton mills and an agricultural department, but with only partial success. He has competent Europeans to guide things, but from lack of material given them, they are unable to get any very good results. His agricultural department is still without ground for the planting of seed,—a *rather* important item in agriculture, one would think. Also, while at the outset, he was willing to buy every agricultural implement existing, now it is hard to get those really necessary. Thus is China's most advanced man only surface-polished with Western ideas and at heart still the old-fashioned Oriental. What China needs most to-day are strong, honest and conscientious leaders and until she gets them she will continue in the rut of impotence she is now in.

ASSOCIATED TEA ESTATES OF CEYLON, LIMITED.

DIRECTORS' REPORT.

FOR THE 12 MONTHS ENDED 30TH JUNE, 1899.

The area of the Company's Estates planted with tea as per last report was ...	1,889 acres.
to which falls to be added as completed during the year ...	16 do.
and for certification of area at Doragalla	25 do.
Making a nett planted area in tea of	1,930 acres.

In addition to which there are 13 acres of fuel trees on Doragalla.

No further extensions are in progress.

The yield was as follows :—

	lb.
Silver Kandy	100,210
Chesterford	280,514
Horagoda	45,700
Doragalla	238,032
	664,456

This shows a decrease of 43,513 lb. on the previous 12 months' yield, and of 119,294 lb. on the aggregate of the Superintendents' estimates. The two high-lying estates gave an increase of 34,371 lb. and the two low-country properties a falling off of 77,884 lb. The Superintendents and the Visiting Agent are unable to give any reason for the deficiency beyond natural causes, the weather in the low country having been unsatisfactory for producing a heavy yield of tea.

Of the crop, the entire produce of one estate was sold in London, and of the three others

partly in Colombo and partly in London. The portion sold in Ceylon, 288,215 lb., realised an average of 37·81 cents, and the 376,241 lb. sold in London, an average of 7·81d, making together, after allowance for freight and charges on the London portion, a total average of 7·28d per pound. This compares with 7·11d per pound for the previous year, and in view of the general level of prices is considered satisfactory.

The Superintendent of Chesterford Estate resigned his position in March, and the Superintendent of Silver Kandy was summarily dismissed on 25 May, under circumstances that may lead to legal proceedings. The item of £414 6s 9d appearing on the balance sheet as a doubtful debt, is money due by the latter to the Company. New Superintendents were appointed in each case, and so far as can be judged, the work under them is proceeding satisfactorily.

The estimates for the 12 months ending 30th June, 1900, are for a crop of 705,000 lb; which will, if realised, be an increase of 40,544 lb. over the yield for the previous year. The estimates are probably on the conservative side, and may with favourable weather conditions, be exceeded. The estate of cultivation, and the circumstances generally of the estates are in every way in satisfactory shape.

The revenue Account shows a nett profit of £3,622 0s 3d, to which falls to be added the balance of £9 4s 4d brought forward from last season, and £19 1s 6d on adjustment of previous year's accounts, making a total of £3,650 6s 1d. Out of this the Directors paid the Interim Dividend at the rate of 3 per cent on the preference share capital, and from the balance they propose to pay the final dividend on same at the same rate (making six per cent for the year) which will absorb £1,800, and to carry forward the balance to the next account.

The Directors regret that the anticipations expressed in the last annual report, and in the circular sent out on the 31st March, 1899, have been unfulfilled, and that consequently the revenue was insufficient to pay any dividend to the holders of the ordinary share capital. It looked during the spring as if a higher level of value was likely to prevail in the future for all tea, but circumstances led to a rapid and continuous fall in prices, and a very low level was current when a large proportion of the season's crops were being realised. In spite of this, prices show, with the exception of one estate, an increase. A profit is shown on rice supply, and exchange was effected at an advance of only three-eighths of 1d per rupee on the previous year. The adverse feature is obviously the deficiency in yield, which may be taken as explanatory of the bad result. The accounts show a material expenditure on manuring, which will be continued during the new season, as the Directors have satisfied themselves that a substantial increase in yield is likely to be obtained by liberal treatment of the cultivation in this manner. The continued failure of the properties to realise the profits expected from them when the Company was formed, has been a matter of grave concern to the Directors, who in a view of the financial results have again drawn only half their fees. The Secretaries have also again made a considerable rebate on the sum payable to them for the London management of the Company, and have waived the commission payable to them upon the amount of profits divided.

Only the small additional outlay referred to in last report has been made upon block account, the Directors having decided to charge to revenue account, on an average spread over several years, any items relative to ordinary additions to buildings and machinery.

The Directors decided that it was contrary to the interests of the Company to take part in the attempt recently made by certain Tea importers to force upon the buyers in London a change in the conditions of sale by abolishing the pound-draft hitherto allowed on each package. While they would have been pleased to see this allowance abolished by mutual agreement, they considered it unwise to join in a quarrel with their customers, and consequently the teas of this Company were offered and sold on the old terms. The Directors have also declined to join in the proposed arrangement for regulating the quantities offered for sale, as they do not consider it would be in the interests of the Company to do so.

Mr. A Bethune, the former proprietor of one of the estates now owned by this Company, having retired from Ceylon after 20 years spent there in planting, has been invited to join the Board, and his name will be submitted to the shareholders at the general meeting for election as an additional Director. The members of the Board consider that his special knowledge of the estate in question, and his general practical experience, will prove of material advantage to the London-executive and to the Company's interests generally.

Under the articles of Association, Sir Alexander Wilson retires from the Directorate, and, being eligible, offers himself for re-election.

An Auditor falls to be appointed by the shareholders at the general meeting. Mr. J M Henderson, F.C.A., is eligible for re-election.

PRODUCE AND PLANTING.

American Tea.—On the strength of a brief paragraph about the snccess of tea-growing experiments in the Southern States, some of the newspapers have endeavonred to construct a mountain ont of a molehill. We can imagine that a few timid shareholders in tea companies have been made unhappy by the following paragraph, which has gone the usual ronnd: "It is predicted that America will in time rival China and Ceylon in the prodnction of tea. Experiments made in tea cultivation in the United States are said to have proved a complete success." The "prediction" comes from Fleet Street, we imagine, and we do not notice any serious decline in tea shares in consequence of it.

An Attempt to Scare Tea Drinkers.—The latest news from the United States abont tea is that certain people interested in coffee are endeavouring to create prejudice against tea by circnlating exaggerated rnmours about its injurious effect. That game has been tried here, bnt did not sncceed. A New York telegram of Wednesday's date to the *Leader* has the following: The sensation today is the reported prostration through excessive tea-drinking of Mrs. Leslie Carter, America's greatest actress. The newspapers take the occasion to print violent articles on the baneful effects of tea, pointing the moral in the physical decline of the English race. The *World* editorially writes: 'Our cartoonists should inform np-to-date facts and depict John Bull as small and scrawny whereas Uncle Sam should be depicted as big and pot-bellied.' Several merchants whom I have consnlted tell me that the tea-drinking scare is being fostered by the coffee trnst, which fears that Sir Thomas Lipton's presence may induce Americans to take to tea."

Indian and Ceylon Teas in the States.—Whether it is due to a desire to push Ceylon tea or not, some

of the American newspapers are publishing information, says the *Pall Mall Gazette*, in respect to the increase in the popularity of the commodity which should gladden the hearts of the planters and cause Mincing Lane no little satisfaction. "The phenomenal increase in Ceylon and India tea has become very striking," is the somewhat tautological comment of one journal. The change of attitude on the part of the American public dates, it seems, from the time of the World's Fair, before which the Indian teas were practically unknown. Each year has shown a decided increase in consumption over the preceding period. No figures are given in support of the contentions, but we suppose that the statements themselves are deserving of some weight. The astute American mind is now considering whether or not tea can be produced in the United States. The conclusion arrived at is that there are several States where the climatic conditions are favourable, but that the cost of labour is too high. There is some hope, however, that the raising of tea in certain of the newly-acquired possessions of the United States will be attempted. Of course, the consumption of tea cannot be allowed to come under consideration without the inevitable reference to the Anglo-Saxon brotherhood. "What a contrast there is between that tea party," said one well-known merchant referring to the acceptance of a present of tea by Admiral Dewey at Colombo, "and the other one in Boston harbour! How indicative of the change of sentiment between two peoples!" Well, if the United States consumers will only buy enough, we can assure them that our Indian planters will be very grateful, and will show not a little enthusiasm on the subject of the Anglo-Saxon alliance.

The Tea Trade of Formosa.—In the Consular report on the trade of Formosa the reference to tea is full, although it resembles official reports from other parts of the Far East in that it points to no improvement in the tea trade generally.

South Indian Planters in Council.—The planters of Southern India seem animated with a spirit of enterprise. Those of them who grow coffee desire to know all about the latest and best machinery for curing the product, and it is a pity that they cannot find the necessary machinery here without looking to the United States for it.

Cinnamon.—The supply at the periodical sales on Monday, the 28th ult., was extremely light, indeed far too scanty for the prevailing demand, and the 960 bales Ceylon put forward went off briskly at a further advance in value. The greatest improvement was seen in first and second sorts, which were 1d to 2d per lb dearer, and even the inferior qualities, that were less eagerly competed for, brought ½d to 1d better prices than were established at the auctions in May last, viz.: Firsts, fine and superior garden cinnamon at 1s 4d to 1s 7d, common to good at 10d to 1s 2½d; seconds, fine and finest plantation at 1s 4d to 1s 7d, ordinary to good at 7d to 1s; thirds, best at 1s 1d to 1s 5d, low woody to fair at 5½d to 11d; fourths, from 5d up to 1s 1d; and broken (in five boxes) at 7½d to 8d per lb.—*Home and Colonial Mail*, Sept. 8.

COCHIN MARKET.

C.N. Oil.—The market reopened this week with our last quotation, but with an increasing demand mainly from Bombay, prices advanced and a good business has been done at R89 to R89/8 per candy for prompt and R91 for one month forward delivery. The European firms have also brought a few parcels of good white oil at R88/12 net per candy. [Market closes today firm at R90 per candy. The latest quotations from Bombay were R4/6 to R4/7 per maund of 28 lb., and Rangoon R58 per 100 visses equal to 365 lb.

Coir Yarn.—A good business is passing with Europe on c.i.f. terms for forward shipment. Supplies arriving from the interior meet with a good demand both from shippers as well as dealers at prices ranging R30/55 per candy according to quality.

Rope Yarn.—This yarn is largely enquired for both from Europe and Indian ports. A good business is reported. We quote today, dry yarn fine color and make R34/42 and candy baled weight.

Coir Fibre.—A few parcels of common fibre arrived during the week, and changed hands at R27/28 per candy. Good bright fibre is worth today R34 per candy.—*Cochin Argus*, Sept. 23.

RUBBER—ARTIFICIAL AND NATURAL.

Artificial Production of India-Rubber.—The artificial production of india-rubber has long been a fascinating problem for chemists. Dr. Tilden has now succeeded in producing it in small quantities, although its commercial production does not at present seem very near realisation. A hydrocarbon known as isoprene was discovered years ago by Greville Williams amongst the products of the destructive distillation of india-rubber, and in 1884 Dr. Tilden obtained it by the action of moderate heat on turpentine. Some isoprene, which was made by Dr. Tilden in the course of his researches in terpenes, was preserved, and on examining these he was surprised to find the contents of the bottles completely changed, and in place of a limpid, colorless liquid the bottles contained a dense syrup, in which floated several large masses of a yellowish solid. This, on examination, turned out to be india-rubber, exhibiting all the characteristic reactions of that body with solvents and also its power of combining with sulphur to form a tough elastic body. The change from isoprene to india-rubber is extremely slow, taking several years to complete, and so far, Dr. Tilden says that although he has tried everything he can think of, all attempts to hasten the action have resulted in the production of a body known as colophene, a thick, sticky oil, quite useless for all purposes to which india-rubber is applied.

Barren Rubber Trees.—From a recent official report we learn that the cultivation of rubber in Madras has proved a practical failure, as, curiously enough, although the trees grow splendidly, they refuse to yield or even produce rubber. The Ceara rubber tree was experimentally planted in several localities in Southern India, and from the way in which the trees grew it was hoped that in due time large quantities of the juice would be secreted and an export trade spring up. Unfortunately these hopes have not been realised, since it has been found that the trees refuse to "bleed" at all when the bark is cut, or do so in such small quantity that it does not pay, expenses of cultivation. Mr. Hooper, who has made a microscopic examination of the inner bark, finds that while the laticiferous vessels or caoutchouc ducts are not absent they are undeveloped and scantily distributed in the bark. This unfortunate result is attributed by Mr. Hooper to the fact that the climatic conditions or soil are not suitable for encouraging the secretion of rubber in the trees.

Rubber of the Soudan.—Whilst on the subject of rubber, it is of interest to learn from the recently-issued report of Sir William Garstin on the subject of the Soudan, that on the White

Nile, in the Bongo and Rohl districts, the india-rubber creeper (Landolphia florida) is found in great profusion, which, as is pointed out, should be an important asset in the future trade of the Soudan, although, of course, the rubber produced from this plant is not of such good quality as that from Para or Assam. We are accustomed to look upon the Soudan as anything but a source of wealth to its holders, but from this report of Sir William Garstin's to the Foreign Office it would appear that there are great potentialities of wealth in the district, and there is urgent need of a scientific examination of the country with a view to the development of its natural resources. The vast forests which line the banks of the Upper Blue Nile, and extend as far as the Abyssinian frontier, and those of the province of Bahr-el-Ghazal, should prove sources of future wealth. In regard to the mineral wealth of the district, very little appears to be known Iron ore is found in the Bahr-el-Ghazel province and also at Darfur, and gold mines were at one time worked in the mountains south of Fazogl. At present coal does not seem to have been discovered.—*Daily Chronicle*, Sept. 8th.

NEW COMPANIES.

Nokhroy (Assam) Tea Co., Ltd., (63479).—Registered Aug. 31st, with capital £10,000, in £1 shares, to acquire any tea estates, lands, warehouses, factories and machinery, to extend, improve, or add to such estates and generally to do all things appertaining to the business of tea planters and merchants. The number of directors is not to be more than 5; the subscribers are to appoint the first; qualification 150 shares. Registered by E. A. Jay 50 Bental Road, Stoke Newington, N.

Straits Tin, Ltd., (63,455).—Registered Aug. 30th, with capital £10,000 in £1 shares, to acquire and turn to account any property in the Straits Settlements or elsewhere, and to carry on the business of miners, prospectors, farmers, merchants, financiers, etc.—*Investors' Guardian*, Sept. 9.

PALLEGAMA GRANT ASSOCIATION.

REPORT.

The Directors regret that it has been found necessary to stop further expenditure. This has been done with the exception of advances to the timber contractor to enable him to convey to the Matale Timber Depot the Ebony lying felled on the Estate.

Under the circumstances the Directors recommend that no further expenditure be incurred at present, and that the Agents and Secretaries be requested to settle so far as possible outstanding liabilities from proceeds of produce bearing in mind the loan specially contracted against the timber,

In the terms of the articles of Association Mr. E. Rosling retires, but is eligible for re-election.

The Balance Sheet made up to the 31st August shows on the one side:—Capital—2,000 shares fully paid up, R200,000; Debts due by the Company—To Timber Contractor, R500; to Auditor, R100; to Agents and Secretaries, R249·59; to Estate Account Balance Sheet, R686·05; to Loan Account, R1,107·26; —R2,642·90; total, R202,642·90. On the other side we have:—Property (Immovable)—Balance from last account, R201,893·59; Nett expenditure from date of last report to 31st August, 1899, R983·37; Less amount at credit of Profit and Loss, R307·07 = R676·30;—R202,569·89; Cash in Bank—R73·01; total R202,642·90. The Profit and Loss statement shows a balance carried to Landed Property account of R307·07.

AN AMERICAN SCIENTIST ON TOUR.

The latest scientific visitor we have to welcome to our shores, is Dr. Edwin Mead Wilcox, Travelling Fellow in Economic Botany, of Harvard University, Cambridge, Mass, U.S.A., whose arrival and departure for the hills we chronicled a few days ago. Dr. Wilcox has since his arrival been staying at Kandy and studying the island's products at the Royal Botanic Gardens, Peradeniya, with the ever ready assistance of Mr. W. Nock, the Superintendent in charge. We had at first understood that Dr. Wilcox's visit was partly in connection with the experiments—or continued efforts rather—in tea-growing in the Southern States of America. But this, we learn, is not the case. Dr. Wilcox is making a tour, which is mainly confined to Ceylon, the Straits Settlement and Java, in connection with the project of starting a Sub-Tropical Department in Cuba in connection with Harvard University. The site of the proposed Department, corresponding in a sense—since it will be instituted with Government assistance—with Peradeniya here, will be in the mountains about seven miles from Cienfuegos, one of the two Southern termini of the railway that passes through Havana on the North. The interest of Dr. Wilcox lies chiefly, therefore, in sugar: and he proceeds by the "Bengal" (in about a fortnight's time) to Java, where Dutch methods of cultivation both in this product and in cinchona and tea will receive further study. Meanwhile Dr. Wilcox returns to the hills tomorrow, being specially desirous of visiting one or two cacao estates in full working, as well as of obtaining first-hand information upon tea. He will also, if time permits, make a visit to a citronella plantation in the Southern Province with a view to getting as complete a knowledge (as an eye-witness) of tropical products in full growth, that are likely to be of service in Cuba. Coconuts, we are told, are not expected to be taken up in this latest acquisition of the American nation. *En passant* we learn that the form of Government to be imposed upon Cuba is by no means decided yet; that a certain amount of lawlessness still prevails, reminding those in charge of American interests there of the former *régime* when Spaniards and Cubans by turn would come in bodies and fire a few shots upon the plantation dwellings, only ceasing when money had been given them to go away—then only to return at a convenient season, as did the Danes in Northumbria ere the power of a Saxon king was triumphant on English soil. Even now Cubans interfere much with the working of sugar properties, and the same one-sided guerilla warfare, periodically bought off, is often carried on. Not until more American soldiers can be spared for garrisoning Cuba—and the long drawn-out fighting in the Philippines now repels this prospect into the dim distance—can the exploiting of the fertile soil of Cuba be taken in hand with safety and success. We are gratified to learn that the *Observer* publications are recognised in the American Universities as giving the best book-knowledge to be had of Ceylon, and to hear that the *Tropical Agriculturist* is regularly consulted by

the numerous scientific students with a bent for colonisation and who are interested in the widely-collected information that is there brought together. We wish Dr. Wilcox a successful tour and hope that his impressions of this island may be among the pleasantest and most useful that he carries back with him to Harvard.

INDIAN TEA ASSOCIATION AND LONDON WHAREHOUSE CHARGES.

The following is from the official minutes of the meeting of the General Committee of the above Association, held in Calcutta on the 5th instant:—

Considered letters, of dates varying from 7th to 29th August, from the twenty-six Calcutta Tea Companies, urging upon the Committee the necessity of taking action, in conjunction with the Committee of the Association in London, in order to obtain a reduction of the excessive charges at present levied by Bonded Warehouses in London. The letters had been previously circulated, and the General Committee in their letter of 17th August to the London Committee of the Association had pointed out that the question was being agitated in Calcutta, and had also enquired with reference to the fresh steps it was understood they had in contemplation, the nature of the action now proposed to be taken by the London Committee. Replies had been sent to the letters from the Companies stating that the whole question was under consideration and that the London Association had been addressed in regard to it. Further letters had subsequently been received from certain of the Companies in question, asking to be furnished with a copy of the letter addressed to the Committee of the Association in London.

The Committee also had before them a Memo., dated 29th August, drawn up by the Chairman of the Association on the subject. In this Memo. the letters received from the various Companies referred to were analyzed. It was also pointed out that judging from some of the letters there appeared to be an impression in the mind of the Directors of certain Companies that the question of the necessity for a reduction of the charges had not hitherto been considered by the Committee or at least had been dropped by them. This was of course incorrect, as the matter had been before the Association, both here and in London for some time past, and had been referred to in the Annual Reports, and also in speeches at the annual general meetings and the Committee had uniformly and at every opportunity followed the policy then indicated, and apparently unanimously approved of by members. The Memo. also dealt with other points in connection with the subject, especially with the question of the best course of action to be adopted in order to obtain a reduction of the charges with the least delay. The question was discussed generally by the Committee, and the following conclusions were arrived at:—

(*a*) That further simple agitation, without any counter-proposition in the event of a reduction not being conceded by the warehouse proprietors, would be ineffective.

(*b*) That the best method of procedure would be the establishment of a warehouse, or warehouses, to be worked on co-operative principles by tea concerns.

(*c*) That the agitation in favour of the abolition of the British import duty should be carried on concurrently with any action taken in the above direction.

The Secretary was instructed to draft a letter to the Committee of the Association in London, in continuation of the letter of the 17th August, stating these conclusions and giving the reasons on which they were based.

TROUT BREEDING AT NUWARA ELIYA.

The stewponds at Nuwara Eliya, containing the fry obtained from the last batches of trout ova, have not yet been dragged, owing, says a local "paper," to the present unfavourable weather at the Sanitarium. Having been used to quiet water all this time, it is feared that if the fry are put into the streams serious injury to them may result, and the authorities are therefore awaiting the cessation of the heavy rains. So far, the stewponds have proved a great success, and the experiment has also met with very satisfactory results at Calsay (Nanuoya), St. Leonards (Udapussellawa), and on the Horton Plains. At Nuwara Eliya there are three ponds situated behind the hatchery, and while two of them contain the ordinary fry, the third holds those of the rainbow species. Mr. Elhart who is in charge of the trout, thinks that of the ordinary fry there are about 1,500 and some 200 of the rainbow variety. All are healthy, and range in size from four to six inches. They are fed twice a day with shrimps caught in the local streams, and they take to this food very well. It may be remembered that the amount of rainbow *ova* got out was 10,000. Half of this amount was handed over to Mr. Wilson Wood, of Kotagala; but a large percentage is said to have died in transit. The consignment did not arrive in good condition, and the yield under the circumstances must be considered satisfactory, and the healthy appearance of those in the stewpond at Nuwara Eliya ought to be an inducement to the authorities to get out another consignment. When the next batch of ova is to be got out has not yet been settled; but the annual meeting of the Fishing Club at Nuwara Eliya is to be held next month, when the matter will be considered. We learn that the stewpond at Queen's Cottage has not been a success, and when last dragged there were a very few fry found in it. This is attributed to the spill not being a suitable one. The fry got washed away, and the pond besides is not fenced, with the result that otters have every chance of getting into it. Otters are said to be plentiful now at Nuwara Eliya, and seven or eight have been caught this year in traps. There are about twice the size of a cat, and R7·50 is being offered for each other killed, while traps for the purpose are also supplied. They have not been able to attack the stewponds, owing their being fenced in, but the streams are frequented and the traps are generally laid by the edge of the water.

The Fishing Club generally is receiving good support, and the number of license issued compares favourably with the past year. Mr. W. E. Davidson has spared no pains in attending to the stewponds, and takes the greatest interest in the welfare of the Club.

MINOR PRODUCTS REPORT.

CITRONELLA OIL.—For forward shipment business continues to be done on the basis of 10d per lb, c.i.f., in drums, in quantity. Spot is quiet at 1s to 1s 1d per lb.

CINCHONA.—The shipments from Ceylon for the week ending August 14 were nil, and the total exports from January 1 to August 14, 1899 show a decrease of 170,623 lb., as compared with the corresponding period of 1898. The cinchona-bark auction, to be held in Amsterdam on September 28, will consist of 5,459 bales Ledger and hybridin; 1,349 bales 702 cases Succirubra. The stock in first hands at Amsterdam consisted on September 5 of 2,165 packages Government bark; 8,858 packages private, including the quantity to be put up in the auction of September 28.—*Chemist and Druggist*, Sept. 9.

PREVENTION OF COFFEE-STEALING IN INDIA.

THE PROPOSED NEW LAW.

The publication in the *Gazette* of the draft Coffee stealing Act Amendment Bill marks, says the *Madras Mail*, another step forward in the adjustment of the planter's relations with his neighbours and his fellow men. It is now a quarter of a century since planters first brought to the notice of Government the need for legislation against coffee-stealing, a crime that was said to be "increasing terribly." In 1878 The Madras Coffee-Stealing Prevention Act, was passed. The Bill originally drafted provided that within certain localities, to be notified, it was to be declared unlawful for any person to deal in coffee without a license from a Magistrate, with whom the granting of such license was optional; every licensed dealer was to be bound to keep books and accounts showing details of every transaction in coffee made by him. Penalties were attached to breaches of these provisions, to the dealing in coffee by any person other than a licensed dealer, to the selling or bartering coffee to any person other than a dealer, to the buying of green coffee from any person other than a licensed dealer or owner of a coffee estate or some person authorised by him, to the possession of green coffee by a labourer employed on a coffee estate, who failed to account satisfactorily for such possession, to the removal of coffee from any premises without permission, and to the gathering, removal or loading and unloading of coffee on any estate between sunset and sunrise. In case of a second conviction for certain of the offences specified, flogging was to be awardable, and despite sundry saving clauses regarding purchases for domestic use, the draft Bill was seemingly a very formidable piece of legislation. The planters approved of the licensing system thus provided for, but objected to the limitation to *green* coffee indicated above, and desired certain protective regulations concerning coffee in transit. The Standing Committee agreed to alter "green" to "green gathered," but asserted that the "special protection which the coffee-planting industry might fairly demand could not properly extend beyond the crop on the ground and the harvested crop in transit through the coffee growing Districts." This is the principle that guided the farmers of Act VIII of 1878.

Complaints began as early as 1879, partly because the application of the Act was thought to be confined within too narrow limits. A host of receivers of stolen coffee were officially reported to be springing up. Not until 1893 was the question of amending the provisions of Section 9 of the Act raised, though this was from the beginning the weak spot of the Act. Since 1893 there has been a steady and persistent representation by the United Planters' Association, and the Nilgiri Planters' Association in particular, of the need for amendment of the Act. The matter eventually came before the South of India Planter's Enquiry Committee, and the result was certain recommendations which have now been embodied in the draft Bill. The words "parchment or cherry dried" are now added to Section 9, which will thus run as follows:—

"Any cooly, maistry or other labourer employed on a coffee estate found with green gathered, parchment, or cherry dried coffee in his possession, and failing to account satisfactorily for such possession, shall be liable, on conviction by a Magistrate, to pay a fine not exceeding five hundred rupees."

Provision is also made for the rendering by coffee planters of certain returns, according to forms to be laid down by Government. The object of this is clear. Sellers as well as purchasers of coffee are brought within the scope of the new Bill; and the provision just referred to will enable District officials not only to ascertain, for example, the amount said to have been obtained by a dealer from his own garden or by purchase, and its disposal, but to ascertain also the amount really produced in the dealer's garden. Properly applied, this Section should strike a severe blow at one of the commonest forms of roguery in connection with the theft of coffee and the receiving of stolen coffee.

THE SOUTH INDIAN COFFEE STEALING BILL.

The following is the full text of the Coffee-Stealing Bill published in Madras *Gazette*:—

No. 3 of 1899.

A BILL TO AMEND MADRAS ACT VIII OF 1878 (COFFEE-STEALING).

Whereas it is expedient to amend Act VIII of 1878 (coffee-stealing); it is hereby enacted as follows:—

1. This Act may be called the Coffee-stealing Act Amendment Act.
2. It shall come into force at once.
3. After Section 5 of the Act the following Section shall be inserted:—

5-A. Every person in occupation and enjoyment of a coffee estate who sells, barters or gives in exchange, any coffee shall at the time enter or cause to be entered in a book to be kept by him a true record of such transaction specifying.

(*a*) The name, residence and occupation of the person to whom such coffee was so sold, bartered or given in exchange.

(*b*) The date of the transaction, and

(*c*) The quantity and description of the coffee so sold, bartered or given in exchange.

4. In Section 6 of the Act for the words "Section 5" the words "Section 5 and 5-A" shall be substituted, and after the word "purchasing" the words "or selling" shall be added.
5. In Section 8 of the Act after the figure 5 the figure and letter 5-A shall be inserted.
6. In Section 9 of the Act after the words "green gathered" the words "parchment or cherry dried" shall be added.

TEA IN EAST AFRICA.

From an article in the *Zanzibar Gazette* of the 30th August we take the following:—

Tea.—We have decided to give this product a trial because of the healthy appearance of the tea bushes at Miss Thakeray's shamba, Mbweni, planted by Sir John Kirk. These were pruned down in October and flushed well, bearing enough new growth in two months to form a plucking surface and leave six inches of pruning wood. Half a maund of Horagalla, Ceylon, Assam Hybrid has been obtained and planted in the new nursery at Mpapa and is growing well. This should give us enough plants for six acres, planting five by five, and leave a margin for supplies and distribution.

I don't think that Zanzibar will ever enter the lists as a tea-producing country, even if low country varieties are found to flourish here, as the labour supply is too small and uncertain. The plentiful supply of organised labour in Ceylon is one of the chief reasons why that country has taken the lead in this industry, while Natal is an example where the comparatively adverse conditions of labour have operated unfavourably. In our present unstable condition of labour we could not do more than grow a few acres for local consumption and perhaps induce the Arabs and natives to cultivate a few trees for their own use. Another point to remember is that tea is a declining market and is probably already over: produced.

UNITED PLANTERS' ASSOCIATION OF THE FEDERATED MALAY STATES.

Parts of Minutes of a General Meeting held in the Selangor Club, Kuala Lumpur, on Monday, 14th August.

Present: Messrs. E. V. Carey (*Chairman*), W. W. Bailey, C. Meikle, L. Dougal, C. M. Cumming, W. Coates, H. d'E. Darby (*Members of Committee*), W. Meikle, G. Shepherd, E. B. Skinner, A. Cathcart, W. Irvine, J. H. Power, A. B. Lake, R. C. Tollemache, J. D. Toynbee, M. Stonor, L. Brooke, F. Callaway, A. Barnwell, W. Greig, H. M. Darby, F. B. Hicks and Tom Gibson (*Hon. Secretary*). *Represented by proxy.*—Messrs. L. Hawkins, V. R. Wickwar, James McClymont, Quintin McClymont and W. R. Rowlands.

Plantain Trade with West Australia.—The Hon. Secretary read a letter from the Resident-General forwarding copy of an inquiry from the Secretary to the Department of Agriculture, Western Australia, as to the possibility of exporting bananas from the Straits Settlements to Western Australia. The Chairman said he had replied to the Resident-General's letter giving him particulars as to the area under plantains cultivated by Europeans in Selangor and asking for information as to prices and demand in Australia. A day or two ago he had heard from the Resident-General in reply forwarding copy of a further letter from the Secretary to the Department of Agriculture, Western Australia, giving information as to best way of packing, quantity likely to be in demand and prevailing prices, and from this letter he had come to the conclusion that the suggested trade was such an extremely small business that it was scarcely worth while pursuing the subject any further, and had written to this effect to the Resident-General.

For the information of the meeting he would mention that in 1898 it appeared that 14,000 cases of plantains were imported into Western Australia, and that, roughly speaking, meant 42,000 bunches. 100 acres, planted 20′×20′, could safely be counted on giving 43,600 bunches per annum and, as there were about 325 acres under plantains on European-owned estates in the Klang district alone, it must be patent to all that there was nothing in it.

Supply of Para Rubber Seed from Singapore Gardens.—The Chairman said that in consequence of the attitude taken by the Singapore Government with regard to the supply of rubber seed to applicants from the Federated States, he had interviewed the Colonial Secretary in Singapore and had been told that, in booking orders for rubber seed from planters in the Native States, Mr. Ridley had acted without authority from Government, and it was the intention of the Singapore Government to repudiate his action, as all orders for seeds from the Colony must be first executed. In consequence of this it had been decided at a Committee Meeting, held on the 22nd May last, that a sub-Committee consisting of the Chairman, Secretary and Mr. Bailey should interview the Resident-General, laying all the facts of the matter before him for consideration and asking for his advice and support. He (the Chairman) and Mr. Bailey had seen the Resident-General, who said that those applicants who held no distinct promise in writing from Mr. Ridley had only a moral claim against the Government, and he doubted whether it could be enforced, but the case of Mr. Bailey was very different and he did not see how it could be disputed. That was how the matter stood so far, but Mr. Bailey would tell them what his case was and what action he was taking.

Mr. Bailey said that early in 1897 he ordered 500,000 Para Rubber seeds from the Botanic Gardens, Singapore, and on 1st April, 1897, Mr. Ridley wrote saying he would supply him with that number as soon as he could at $10 per 1,000. As he was forming a company to plant rubber in Selangor, he wrote officially to Mr. Ridley on 12th August, 1898, asking him what number of seeds he could supply him with from 1st September, 1898, to 1st. September, 1899, as it greatly depended on the number of seeds available as to whether the company went through or not. In reply Mr. Ridley said he would be unable to supply the complete order from the present crop, but, as he was the pioneer of the cultivation, he would guarantee that he should have half each crop of seed till his orders were filled. The present crop of seed is expected to be 150,000, yet he is now offered only 15,000, which is a very different thing to above promise from Mr. Ridley.

The Resident-General, at the interview mentioned by Mr. Carey, had stated that he had a legal claim and he had already put the matter into the hands of his lawyers.

The Chairman said he hoped the meeting would express their willingness to support Mr. Bailey in his action.

Mr. Lake asked if this expression was meant to imply that the Association should support the action in a monetary sense if necessary.

The Chairman said he certainly considered so, but there was not much likelihood that such help would be required.

The proposal met with the unanimous approval of the meeting.

Proposed Agricultural Department.—The Honorary Secretary read a long letter from the Resident-General in reply to one from the Association urging on him the desirability of forming an Agricultural Department for the Federated Malay States. The Resident-General, while assuring the Association that the proposal is one which has his fullest sympathy, as the benefits to be derived from such a Department, if properly managed, are unquestionable, said the only point to be considered is whether the Federated Malay States can afford the funds required for such a purpose—he points out that the Association is mistaken in supposing that the present high price of tin is making such an increase in the revenue, that, after meeting the charges for railway construction, there are funds available for other purposes. On the contrary, the question is whether the funds can be found to complete the railway by the year 1902, a date which it was originally hoped would see the whole extension completed. The Government, however, has recently begun the organisation of a Forest Department to the prospective value of which they attach very great importance, and it might be possible for this Department to undertake some of the work the Association think should be entrusted to a new Department of Agriculture. The Resident-General further says that the question will receive his best consideration and asked the Association to favour him with an estimate of what the Committee, as experts, consider would be the annual cost of such a Department as they would recommend, for, say, a term of three or five years, showing the approximate area to be cultivated and the probable revenue that might be expected from the sale of seeds and plants.

The Chairman said that the above letter had been considered by the Committee on 22nd May, and the Honorary Secretary had been instructed to write thanking the Resident-General for his obvious sympathy with the request of the U.P.A., particularly with regard to the last paragraph, and informing him that the Committee hoped to submit certain suggestions on the subject at an early date. With a view to doing so, the Hon. Secretary was also instructed to send a circular to all members asking them what particular products they think should be experimented with and what information is wanted. This had been done and a number of replies had been received.

It was quite evident from the Resident-General's letter such a comprehensive scheme as that laid before him originally would not go through, so they had now to confine themselves to the Resident-General's suggestion in the last paragraph. The Committee had gone carefully into this matter and had come to the conclusion that if Government could be got to carry out certain experiments with those products at present of most importance to planters—viz., rubber, coconuts and coffee—great benefits might be derived by the planting community. It must not be thought that the

committee in mentioning these three products only had lost sight of many others which might be of importance, but what was wanted was a start, and he thought all present would admit that the three mentioned were the most important to planters at the present time.

After discussion the Chairman drafted the following resolution, which was proposed by Mr. Bailey, seconded by Mr. C. Meikle and carried unanimously—viz:—"That a letter embodying the views of the different members of the Association be drafted by the Hon. Secretary and circulated amongst the members of the Committee suggesting to the Resident-General that exhaustive experiments dealing with the products named should be undertaken in Perak under the guidance of Mr. Derry; and that a sum sufficient in that gentleman's opinion to put these experiments through in a thoroughly workmanlike manner be provided by the Federated Malay States Government, and that Mr. Derry's opinion be invited as to what the probable monthly cost of such experiments will be."

A Proposed Association for Stimulating the Consumption of Coffee.—The Chairman, in introducing the above subject to the meeting, said he hoped every member would give it his best attention as it was one of the most important that had ever come before the Association. Mr. Hicks had sent him a copy of the *South American Journal* containing the proposed scheme, and on reading it he had been struck with the excellence of the idea.

The suggested scheme of an universal self-imposed tax of five gold cents a bag—equal to about 10 of our cents—proceeds of which would amount to an annual revenue of £125,000, appeared to him so simple and so likely on account of its pressing so lightly upon the individual, to recommend itself to all producers that he thought some action should be taken in the matter and that was the main reason for calling this meeting. The great feature of the proposed scheme was it comprehensiveness, embracing, as it does, the interest of all growers, whether of the high-grade Arabica or the less valuable Rio and Santos and Liberian coffees, which are absolutely identified, and the suggested tax whilst if universally supported, it will provide such an enormous fund, still presses so lightly upon the individual as practically to amount to no tax at all, it was in fact the only workable proposal that had ever been laid before producers of coffee, and he sincerely hoped that the members present would give it their warm approval.

The following resolution was passed:—"That the Hon. Secretary be authorised to forward the *South American Journal* coupon to that paper, signed by the Chairman of the U. P. A., expressing their cordial approval and warm support of the proposed scheme, and further that the Government be asked, if in the event of the suggested proposal reaching a point where it is ready to be worked upon, they will co-operate by levying a 10 cents per pikul bag tax upon every bag of coffee exported from the Federated Malay States."

Mr. H. M. Darby seconded and it was practically carried unanimously, there being only one dissentient vote by proxy.

Mr. Brooke said he thought the scheme should be made as public as possible and would therefore propose the following resolution—viz.,

"That the Hon. Secretary send copies of the article to all other bodies and associations with whom we are in touch in this part of the world."

Mr. Lane seconded the resolution, which was carried unanimously,

TOM GIBSON, *Hon. Secretary, U.P.A., F.M.S.*

CACAO PESTS.

The "local fly"—I call it the paddy-field fly (writes a planting correspondent from Matale)—is on again. I captured about two dozen at 9 a.m. yesterday from my umbrella, while going through a cacao field. This, I believe, is about its tenth or eleventh appearance since April, 1897, the last being in February this year. Unlike the *helopeltis*, this fly seems to attack everything in vegetation, both cultivated as well as what is growing wild. No wonder this happens just after the paddy crops have been harvested, and lands for chena cultivation are being burnt and cleared all round. Much of the disease in the cacao, and paucity of flush in the tea, as it has been so destructive to my annatto, I am afraid, are all due to the attacks of this insect. To plant life its shadow is death! In April last I sent a specimen of this insect to the Director of the Royal Botanic Gardens, and he sent it on to the Director of the Museum; but neither could say what name it had in the world; and left its solution for Mr. Green after the latter had returned from Europe.

TRAVANCORE TEA SALES.

Average 9·02d. September 15th.

Garden.	Total. Quantity.	Aver. Price.	Bro. Or. Pek. or Flowery Pekoe. Quantity.	Price.	Pekoe and Unassorted. Quantity.	Price.	Bro. Pekoe. Quantity.	Price.	Pekoe Sou. Quantity.	Price.	Broken and Souchong. Quantity.	Price.	Fannings, Dust, and Various. Quantity.	Price.
Travancore ...	777	6·54												
BA ...	8	5¾	—	—	—	—	—	—	—	—	8	5¾	—	—
Bon Accord ...	90 p	6¾	—	—	31	6½	29	7¾	17	6	—	—	13½c	5¾ 6¾
Ellangy ...	132	5¾	—	—	63	5¾ 6	25	6½	33	5½	3	4¾	8	5½
Great Valley ...	80½c	6	—	—	50½c	6	25½c	6¼	—	—	3½c	5½	2½c	5¼
Isfield T C Isfield...	35 p	6¼	—	—	16	6	12	7	—	—	—	—	7½c	5½
S T T Co Venture	89	6¾	—	—	48	6½	33	7½	—	—	1	5¾	7	5½ 5¾
Stagbrook ...	202	6¾	51	7 7¾	68	6½	—	—	42	6¼	38	6 6½	3	5¾
Vembenard ...	141	7	15	7¼	38	6¾	55	7½	14	6¼	10	6½	9	6½

In these tables all packages are chests unless otherwise stated. ½c for half-chests; p for packages.

PRODUCE AND PLANTING.

Import Duties on Tea.—A despatch, dated July 12 last has been received at the Foreign Office from H.M. Ambassador at St. Petersburg, reporting that, according to a decision of the Council of the Empire, passed on June 4-16, 1899, and published in the Bulletin of Laws of June 25-July 7, 1899, the following alteiations, under the Russian Customs Tariff in respect of the duty payable on tea are, according to the "Board of Trade Journal," decreed: 1, Brick tea, black and green imported into Russia across the European frontier to pay duty at the rate of R11·25 per poud (former duty, R31·50 per poud). 2, Black, flower, green, and yellow teas imported at the frontiers of the Steppe, Irkutsk and Cis-Amur Governor-Generalships to pay duty at the rate of R22·50 per poud (former duty R19·50 per poud). With the completion of the Russian lines of rail to the Pacific the rates of the duty on tea will be subject to further consideration.

Tea Cultivation in the United States.—With reference to the exaggerated statements about tea cultivation in the United States, to which we referred last week, a writer in the "City Press," says: "I wonder what Mincing Lane thinks of the statement that experiments in tea cultivation in the United States have proved a complete success, and that America will in time rival China and Ceylon in its production. I do not know what is to prevent the successful cultivation of tea in the Southern States, but I could not think it likely to be profitable. There is about as much put upon the markets of the world as can be disposed of, and prices rule so low that there seems nothing to gain by further competition. There is, however, another side to the question. From the tea-drinker's point of view the revolution effected by the success of the Indian plantations has not been an unmodified advantage. I have never become reconciled to the flavour of the Indian tea, but have been sufficiently philosophical not to be very much troubled about it. If the American tea should prove to be superior in quality, and delicate in flavour, like the better teas of China and Japan, there may be some chance that its cultivation will pay." It will be seen that it is not from a tender regard for the feelings of India and Ceylon growers that this correspondent has been moved to write. While admitting that the experiments in America are unlikely to prove profitable, he is not averse to expressing a faint hope that there may be some chance for American tea if the growers can only produce that delicate flavour he loves so well. But even this does not demolish his contention that the cultivation of tea is not likely to pay.

Pushing China Tea.—The attempts made to revive the taste for China tea take various forms. The following, referred to by a correspondent of the "Liverpool Courier," refers to one of the latest of these. He writes: "It is the universal practice in London—and for anything I know to the contrary it may be the universal practice in the provinces—for hotel-keepers and publicans to designate the best liquors which they retail by the glass as 'special.' Hence the customer will call for 'a special Scotch' or 'a special Irish,' and even if he calls for a glass of port or sherry he will probably be asked if he wants 'special.' I mention this because it partly explains a significant little incident in my recent experience. I went into an unlicensed restaurant and called for a pot of tea. 'Special tea?' at once queried the dainty maiden in attendance. I was rather surprised and amused, for with a wide experience of such establishments I had never heard that question asked before. 'What do you mean by "special" tea?' I inquired. 'Why, good tea—China tea," she answered, with a strong emphasis on the word China. Of course I ordered the special tea, and, served as it was with the accompaniment of cream, I found it very well worth the extra charge of twopence. The incident set me upon making special inquiries, and as a result I find that the incident is simply the sign of a reaction against Indian and Ceylon teas and in favour of China tea. Having always used China tea in my household, and being familiar with its greater delicacy and superior hygienic qualities as compared with other teas, I rather wonder the reaction has not begun sooner. It has been hindered by the higher price of China teas which, taking them grade for grade, are about one-third dearer, whilst the very best qualities of China tea are more than double the price of the best Indian and Ceylon teas. Then, too the average housewife does not understand that China tea, especially if it is good, requires a minute or two longer to infuse. I now learn, however, that in the best hotels and the best houses in London it is China tea that is generally used, and that medical men are more and more advising their patients to give it the preference."

The Profits of Tea Retailing.—The "Grocer" quotes from a handbill issued by a London tea retailing concern, in which is the following: "Remember—tea is sold at a price within the reach of all, viz., 2s per lb. Owing to its immense strength and fine quality it will go twice as far as many ordinary teas, and is therefore cheaper. The —— Tea Company, Limited (incorporated under the Companies Acts, 1862 to 1898), will pay to every woman who becomes a widow the following sums of money: If, at the commencement of taking tea, the husband is under thirty years of age £30; forty, £25; fifty, £18; sixty, £12; seventy, £7; provided she has purchased a half-pound of tea for the five consecutive weeks prior to her becoming a widow. Customers who purchase a quarter-pound of tea weekly will receive half the above sums. In the interest of bona-fide customers the Company require that the husband shall be proved to be in good health at the commencement of the continuous taking of the tea. Quarter benefit in five weeks, half benefit in six months, full benefit in twelve months. List of moneys paid with the names and addresses of the widows who have received the benefit, can be seen at the registered offices of the company in London or at any of the company's branches."

Jyree Tea.—"By the kindness of Mr. G. S. Peterson, of Weston-super-mare," says the "Kew Bulletin," "we have received a sample of this so-called tea, and find that it is made of leaflets apparently belonging to some species of Acacia. Mixed with the leaflets are petals which may well be those of a Cassia, and a little ordinary tea had been added to one sample, but Mr. Peterson says that such is not always the case Jyree tea is the name under which this mixture has been offered for sale in Britain. It is of Indian origin, probably from Madras, and cannot as yet be said to have any extensive use. 'Jyree,' we are informed, is a name derived from that of the native servant of an Anglo-Indian who claims to have discovered its virtues. 'Jyree' oil is said to be a cure for aches and sprains; 'Jyree' soap is said to soften the skin, and 'Jyree' may be used, too, for softening leather."

THE CHARGES ON TEA.

Elsewhere we refer to the question of Customs rates and Warehouse charges. Upon the subject of bulking in London, a correspondent, signing himself "Planter," in the course of a letter which is an indictment *inter alia* of the agency system, so far as charges, commission, &c., are concerned, which we do not think it necessary to print in its entirety, says: "Notwithstanding the most painstaking personal supervision of this operation, which I carried out at the factory for years, break after break of tea was reported from London as irregular in quality, necessitating rebulking there, and I ultimately gave up the practice and packed each day's manufacture separately. In the light of observation made during the past two years in London, it has become quite evident to me that my agents have not supported my efforts to the extent I, as manager

of the estate, or as a shareholder, am justified in expecting of them. It is obviously against the interests of companies selling in London to have their teas bulked there, as the charges are heavy, and besides the teas deteriorate in quality from the operation, and it is surely the duty of the home agents to see that those charges are avoided. They, however, say the broker is the responsible party, and if this connection be correct, then on what grounds do they—the agents—claim to earn the 2½ per cent commission on gross sale proceeds of the teas. My agents charge 2½ per cent at Calcutta and 2½ per cent on this side."

"The Geisha" up to Date.—An Anti-tannic Tea Infuser Syndicate has been formed to exploit the merits of a patent teapot, the invention of Miss Bain, and as one of the means to that end, arrangements have been entered into "to supply by cable notice sixty Geisha girls who would serve tea in full Japanese costume." Whether Japanese tea is to be served from the teapot or whether Indian and Ceylon teas will be considered good enough does not appear from the circular issued to the shareholders. This circular, which extols the merits of the "Geisha" teapot, mentions that it "should more or less cause a revolution in the liquid tea trade, and be placed in the heart of every household. Being a source of novelty as well as utility, it should also open up a splendid field for advertising. It is our intention," says the circular, "to take advantage of this means of profit by introducing so many thousand teapots to the public, as, for instance, the Lyons, the A.B.C., Slaters, Limited, or any other large company that will remunerate us for such advertisement without disfiguring the article. With regard to the dry tea trade, we intend to manufacture specially-designed pots, such as the Tower teapot, Mazawatte, &c., and to sell to all agents who deal in these particular brands of teas, so that their advertisement will always be under the immediate eye of the user. The Carpetto Syndicate have kindly consented to push our concern to the best of their ability, and as they are more or less working in every theatre, restaurant, hotel, music-hall, mansion, club, &c., their aid should prove invaluable—in fact, they are now putting the 'Geisha' before the Gordon Hotels, London and North-Western Railway and others with a view to supplying them throughout. It is reasonable to suppose that, if the A.B.C. could form such a gigantic concern on aerated bread, an article such as we possess must eventually prove to be nucleus of the liquid tea trade. We hope at no very distant date, if successful, to place before the shareholders a group of City shops, which we have well in hand, with a view of working them on the lines of a

'GEISHA' TEA-HOUSE.

Our chairman has also entered into negotiations with Japanese agents to supply by cable notice (if necessary) sixty Geisha girls, who would serve tea in full Japanese costume. The absolute novelty of this idea, combined with a better and healthier cup of tea, should prove very lucrative to the syndicate if they think it desirable to take the matter up. An attractive display of 'Geisha' teapots is on view at the Greater Britain Exhibition, Earl's Court, and inquiries are daily reaching the office from various parts of the country asking where these teapots can be bought in London and the provinces. It is gratifying to report that the 'Geisha' has been awarded the Exhibition gold medal. We have quite unexpectedly executed a trial order from Paris for teapots, and are now packing several teapots in completion of a repeat order from Messrs. Cooper, Cooper and Co., Limited, London, which firm has now had over 2,000 teapots within the past few months. Several china and earthenware manufacturers have applied to us for permission by license to manufacture for sale to their own customers our patent teapots, for which they offer to pay royalty from 4d to 4½d per pot. For the present we have considered it prudent to grant only one license, and in that instance we have restricted the output to 100,000 teapots, which must be sold at prices and discounts uniform with our printed lists. We are at present considering offers from foreign manufacturers to make and sell in foreign markets; it is also our intention to have our teapots made in Japan at very low cost, and sample patterns are now on their way out."

The Teapot and the Tea.—As regards the effect of the teapot on the tea, a report from Mr. George Combe Stewart, F.C.S., M.B.P.C., &c., public analyst and consulting chemist at the County of the City of Glasgow, says: "I hereby certify that I have carefully tested, in a practical manner, an ordinary teapot fitted with the tea infuser and separator (Bain's patent) which was submitted to me. I have also read the descriptive pamphlet which you have issued to the public, and I am of opinion that there is nothing stated in the pamphlet which the performance of the apparatus does not fully justify. The following points, which are not mentioned in your circular, were brought out by me in my experiments—namely: 1. It is considerale saver of tea over the ordinary methods of tea making as now practised in this country. Given a teapot large enough for a family meal there would be no necessity for second infusions, the last cup served being as free from tannic acid as the first served off. 2. It thoroughly filters the infusion, allowing no sediment or powdered tea to be found in the beverage, and uniformly insures a beautifully clarified and refreshing cup of tea. 3. It allows the boiling water to be kept in contact with the tea leaves just the exact and proper time for extracting all the theine, allowing none of the bitter elements to go into solution."—*H. and C. Mail*, Sept. 22.

COFFEE CURING.

MR. JAMES WESTLAND'S LETTER.

Planting Opinion to hand contains a copy of a letter addressed by Mr. James Westland, of Gammaduwa, to the Secretary, United Planters Association, of South India, and forwarded through the Ceylon Planters' Association. The greater part of it is devoted to a description of coffee curing in Ceylon, which need not be reproduced; but the beginning and end of the letter is as follows:—

Sir,—In today's paper appears your resolution inviting information from members of your District Associations as to the result of any special system adopted in the Curing of Coffee on Estates. Although not a member of your Association, I have been a long time connected with coffee growing, and have had some experience as a Coffee Estate Manager during my nearly thirty years' residence in Ceylon. My system of curing coffee on the estate may be the system generally adopted by Indian planters; if so, you will know how to treat this, but should it be slightly different from that in general use. I think it will pay your coffee planters to closely follow my system, which I carried out on Golconda from 1872 to 1888. Old sale lists will prove, with what result. . . . . . .

Coffee dried slowly, and given a half-day's sun a day or two previous to despatch, will, when finally cured, be a far prettier bean than coffee cured by two or three successive days in the sun. It may help you to realize the importance of the system if I mention, at the risk of appearing egotistical, that the owner of an extensive property in Haputale gratefully acknowledged these hints, and gave me, through his son who was then the President Manager, a present of a cheque for R250, because of the result from his adopting my system of curing, and afterwards, on every occasion his son left for England, I had the

supervision of his large property in addition to my other charges. It may also interest you to know that in Ceylon there is a coffee sieve known as Westland's Sieve Plate, made by Walker & Sons, Kandy, which is recognised as a very useful style of sieve to have on one's Pulper. It has oblong instead of round holes, and allows almost no cherry to pass unpulped.

This letter is written solely with the object of aiding my brother-planters who are still trying to make the most they can out of coffee, and you are welcome to make any use of it you think fit.

LOCAL TEA REPORT.

(September 1899.)

[TARRANT, HENDERSON & CO.]

Total number of packages offered during :—

	1899. pkgs.		lbs.	1898. pkgs.		lbs.
Jan. ..	40,704	equal.	3,196,299	48,698	equal.	3,855,261
Feb. ..	30,685	,,	2,426,407	27,105	,,	2,130.761
Mar. ..	43,109	,,	3,422,100	29,953	,,	2,359.291
Aprl. ..	34,029	,,	2,698,200	32,243	,,	2,562,835
May ...	56,082	,,	4,363,099	45.555	,,	3,631,532
June ..	41,720	,,	3,253,196	56,184	,,	4,451,588
July ..	41,930	,,	3,287,569	39,159	,,	3,077,724
Aug. ...	45,253	,,	3,393,269	41,899	,,	3,181,581
Sept. ..	36,786	,,	2,884,707	30,703	,,	2 403.584
	370,298		28,924,846	351,499		27,654,157

MARKET.—Throughout the month has been very firm with an upward tendency, and closing prices for the month showed a distinct advance over closing rates in August.

QUALITY.—Shows improvement.
WEATHER.—Generally unfavourable for growth.
EXCHANGE.—Firm.

GENERAL.—Statistically the position of tea throughout the world is generally strong, and, judging from present prospects, the output of both Ceylon and India is likely to continue on a moderate scale. There is evidently every reason for presuming that prices, particularly for common kinds, will remain firm until the end of the year.

MOVEMENTS OF TEA IN LONDON DURING AUGUST, 1899.

	Imports. lb.	Deliveries. lb.	Stock. lb.
Ceylon ..	9,413,876	8,633,180	24,373,006
Indian ..	13,472,938	10,015,542	28,474,353
Java & China ..	4,826,966	3,414,857	18,093,689
	27,713,780	22,063,579	70,941,048

SHIPMENTS TO THE COLONIES COMPARED WITH THE SAME PERIOD 1896-98.

	1899. lb.	1898. lb.	1897. lb.	1896. lb.
Jan. ..	825,457	1,290,955	956,977	775,127
Feb. ..	1,740,632	1,031,972	787,916	934,018
Mar. ..	923,463	1,151,687	1,279,468	1,444,466
Apr. ..	1,315,033	1,184,076	1,235,369	937,661
May ..	1,244,660	1,832,110	1,500,345	1,146,872
June ..	1,418,146	1,561,280	983,361	1,261,555
July ..	1,586,5C3	1,129,211	967,546	776,557
Aug. ..	1,647,010	1,179,516	1,077,555	647,463
Sept....	1,497,831	904,218	954,263	709,811
	12,198,735	11,265,025	9,742,800	8,633,530

EXPORT OF CEYLON TEA AS PER CHAMBER OF COMMERCE PRICE CURRENT DATED 3RD OCTOBER, 1899.

		1899. lbs.	1898. lbs.
To United Kingdom	..	76,887,609	74,534,260
,, Australia	..	12,222,006	11,258,725
,, America	..	2,219,553	1,816,009
,, Russia	..	2,719,244	1,914,486
,, Germany	..	289,578	267,619
,, France	..	76,014	61.519
,, India	..	417,300	864,622
,, Holland	..	22,874	22,631
,, Africa	..	231,088	301,740
,, Other places	..	1,414,852	1,159,810
	Total	96,500,118	92,201,421

MINOR PRODUCTS REPORT.

(*Chemist and Druggist*, Sept. 16.)

QUININE.—Dull and easier. Quotations in second-hands, have dropped about ¼d per oz. Today's quotation is 11½d per oz. spot (with buyers at 11¼d) and 11¾d for December delivery, which figure has been paid. Makers' prices are unaltered.

CINCHONA.—At auction on Tuesday supplies were again small, amounting to 1,907 packages (including 729 packages all more or less damaged by smoke in the late fire at Bull Wharf). The demand was quiet, although the bulk was disposed of at lower rates, or generally on a unit basis of 1⅛d against 1⅜d in August and 1⅙d at the last Amsterdam auctions.

CARDAMOMS.—Meagre supplies were catalogued to-day, consisting mostly of Ceylon-Malabars, for which there was no demand. The following rates were paid:—Ceylon-Mysore, dull bold long bleached 2s 8d to 2s 9d; medium ditto 2s to 2s 2d; small ditto 1s 10d; splits and pickings 1s 5d. Ceylon-Malabars, medium lean brown 1s 8d. No seeds were sold publicly. Some of the parcels offered were not on show in time.

The shipments from Ceylon for the week ending August 22 were 6,711 lb.

SALE OF A COFFEE ESTATE.

This afternoon at Messrs. Powell and Co's sale-room, the valuable property known as the Silian Coffee Estate, about ten miles from Port Dickson, was put up for auction. This freehold property which consists of about 2,000 acres, together with buildings thereon, was disposed of to Mr. Rahmin for $8,500.—*Singapore Free Press*, Sept. 28.

THE INDIAN TEA TRADE, Mr. O'Connor in his review of the Trade of India in 1898, has a word of encouragement to say to those tea planters who are beginning to cry out about the decline in their industry. He points out that last year the outturn of Indian tea was the largest on record, giving a total of 157 million pounds, being more than double the quantity exported thirteen years ago. When a limited market is found in conjunction with an unlimited supply, the inevitable result is a heavy fall in prices. Yet Mr. O'Conor would not have the Indian planters give way to despondency. He recalls the fact that it took Indian tea twenty years to drive Chinese tea out of the market, and he reminds us that Indian tea is at present consumed in a comparatively limited area. A very large proportion of the white race of the world does not yet consume tea. In France, for example, the beverage is still used only for medicinal purposes. Mr. O'Conor warns the planters that in their efforts to force their way into these huge untapped markets they must be prepared for a struggle as strenuous as that undertaken by them when they entered the lists against China tea. But with courage and perseverance there is no reason why they should not forge ahead. —*Times of India*, Oct. 4.

CUSTOMS AND WAREHOUSE.

We append the Custom House rules as to teas bulked in London, and the warehouse charges on tea, which will be of special interest at the present time.

The difference between bulking, which costs 1s, and bulking and taring, which costs 1s 5d per chest of 129lb. gross, is 5d, a heavy item to pay for simply weighing an empty package. Ceylon bulks only 28 per cent of its import in London, while India bulks about 90 per cent here, thus increasing the cost of laying down its tea considerably, instead of following the example of its younger rival and completing the work on the factory. China and Java always put their tea on the market in a finished condition, while in India only a very small proportion of the planting community seem able to do this. The trade (including Lipton) all admit that they much prefer garden bulked tea (if it is properly done, of course), as it saves the tea from being exposed to much injury to its keeping qualities. Where the bulking is done here the tea suffers, while the lead lining of the box is almost destroyed. Before long it will be absolutely imperative that all the work be done in the factory, thus saving London charges. The example of the few Indian tea companies which bulk on the garden might with advantage be followed by all. They seem to have no difficulty in carrying out the process, or in securing even tares:—

GENERAL ORDER, CUSTOM HOUSE, LONDON, DECEMBER 22, 1894.

TARING OF BULKED TEAS.

Officers are informed that paragraph 62 of General Order 127, 1892, in regard to the taring of Indian, Ceylon and Java teas, has been cancelled, and that the following regulations are to be observed instead thereof:—

In the case of teas bulked in warehouse, for which average tare has been allowed prior to the operation of bulking, that tare may be retained, provided the packages which were selected for taring on taking the landing account did not vary to a greater extent than 2 lb; or the actual tare of each package may be taken at the time of bulking.

If the selected packages varied to a greater extent than 2 lb, each package must be tared at the time of bulking.

All copies of G. O. 127, 1892, are to be noted accordingly.

By order of Board
John Courroux.

GENERAL ORDER, CUSTOM HOUSE, LONDON, FEBRUARY 11, 1899.

REWEIGHING OF TEA AFTER BULKING ABOLISHED; AND AMENDMENT OF GENERAL ORDER 107, 1894; AND CODE PARAGRAPH 441.

The Board direct that the general practice of reweighing tea after the operation of bulking be relinquished, the usual request for permission to bulk parcels of tea being still required as hitherto. In order, however, to maintain the principle of a check on all operations in bonded warehouses, the surveyors at the tea stations will occasionally as a test-check in the ordinary course of their daily visits call for the production and reweighing in their presence of some of the packages of tea after bulking and refilling. The board further direct that the regulations contained in General Order 102, 1894, as to the taring of bulked Indian, Ceylon, and Java teas be amended as follows:—

Delete the words—

If the selected packages varied to a greater extent than 2lb each package must be tared at the time of "bulking";

and substitute the words—

If the selected packages for an average tare vary to a greater extent than 2lb, and the surveyor be satisfied that the difference is only exceptional, an actual tare may be taken for the exceptional package or packages, and an average tare given for the remainder of the bed by selecting other packages in lieu of those rejected: provided that the warehouse keeper also agrees to the course adopted.

The Board further direct, in concurrence with the Board of Inland Revenue, that the provisions of Paragraph 441 of the Warehousing Code, which will be affected by the abolition be amended accordingly, by deleting the words—and payment to the collectors of a deposit sufficient to cover the expense of the officer re-weighing.

Copies of general orders, 127, 1892, and 104, 1894, and of the code, are to be noted accordingly.—By order of the Board, (Signed) R. T. Prowse.

BONDED TEA WAREHOUSES.

CHARGES ON TEA.

To apply to all parcels by ships reporting on and after July 1st, 1888, and to New Season's China tea arriving prior to date.

PACKAGE WEIGHING GROSS.

	Not exceeding 16 lb.	17 lb. to 34 lb.	35 lb. to 44 lb.	45 lb. to 59 lb.	60 lb. to 79 lb.	80 lb. to 89 lb.	90 lb. to 129 lb.	130 lb. to 159 lb.	160 lb. to 199 lb.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Landing and Housing Rate ..	0 3	0	0 10	1 0	1 3	1 4	1 6	1 10	2 3
Management Rate ..	0 4	0 7	1 0	1 2	1 5	1 8	1 10	2 3	2 9
Bulking and Taring ..	0 4	0 6	0 8	0 11	1 2	1 3	1 5	1 8	2 0
Bulking, Taring or Weighing net separately ..	0 3	0 5	0 6	0 8	0 10	0 11	1 0	1 3	1 6
Rent per week ..	0 0¼	0 0¼	0 0¼	0 0½	0 0½	0 0½	0 0¼	0 0¾	0 1

Discount 10 per cent.

The above rates are chargeable on the average gross weights on each break. When the fraction of the average weight is half a pound or more the higher rate will apply. Thus: The average of a break being 79½lb gross, the whole break will be rated at 80 to 89lb, but the average being less than 79½lb the whole break will be rated at 60 to 79lb —*H. C. Mail* Sept. 22nd.

Correspondence.

To the Editor.

THE LATEST ABOUT RUBBER.

London, Sept. 7.

SIR,—It may interest many of your readers, now that "India Rubber" is coming to the front, to know that we have received an important drawing and full particulars of the experience with this—*castilloa elastica* seed. In one case the seed had been planted in the shade, as was suggested and is adopted generally; the other was planted in the open. I had hoped to send you a photograph by this mail of a drawing which has been sent to us. I may tell you that the description at the foot of the drawing reads as follows:—

"Rubber plant raised from seed grown in open ground in full sunlight, 1st July 1898—measured and sketched 3rd July 1899, circumference of stem one inch above ground 5⅜ inches, height of top-most branch 4ft. 2 in., spread lateral of branches 5ft." Alongside of this "large tree" are three others, "average sized plants of many thousands sown in forest shade 3rd July 1898—sketched and measured 5th July, 1879, height 1 ft. to 14 inches. Leaves larger than plants sun-grown, but stems very slender and will not bear transplanting into sunlight.

I send you a small drawing showing the difference in the size of the stems, but this will, I hope, be very clear when the photographs are printed.

There is another point that I would like to refer to: in your last number of the *Tropical Agriculturist* you state that you are not aware if one of the new rubber machines has been sent out to Ceylon. As far as we know, none have been sent to Ceylon. The work was first done in the West Indies, then in Brazil, and, as they have been found to answer, the demand is much larger than the supply and we have to beg of those who have had machines to be moderate and patient, because we think they cannot require such a quantity at once. We are endeavouring to send out machines to new countries when applied to, as they are very simple and inexpensive.

As your paper is so widely read, there is another event which has occurred this week which may be of interest to your readers. It has been known now for some time that there is on the East coast of Africa a plant, the root of which cures black-water fever, this quotation on the authority of an English surgeon who has well worked out the subject. He has sent home a hundred pounds of this root, which is evidently a plant of the acacia tribe, judging from the pod which arrived, in a rotten state, in the package. We have treated a certain quantity of this root in one or two ways, so as to bring it as near to the fluid extract as possible, because the surgeon stated that when he first found this bark it was to cure one of the native bearers on an expedition, and thinking that the man would be dead in the morning he spoke to the head man in charge of the coolies, when to his surprise he said: "Oh, the man will be perfectly well in the morning; I will give him a dose." He went with this man, dug up the roots, and watched the roots boiled down and the decoction given, and the result was as indicated, the man was well in the morning and able to carry his load. A supply of roots having been secured, they were tested on the East Coast and in every instance found to be efficacious upon Europeans.

We are sending out some of this fluid extract to be tested in cases of yellow fever in Brazil, and we are supplying different parties who have establishments on the East and West Coasts of Africa.—Yours truly,

THOS. CHRISTY.

RUBBER PREPARATION: THE NEW MACHINE.

London, Sept. 15.

DEAR SIR,—Having seen the note in your issue of Aug. 1st, I have pleasure in sending you herewith a drawing of our "Beta" Rubber Machine, and at the same time directions for working. It will no doubt be of particular interest to you to hear that with this machine Para Rubber can be coagulated with ease. The enclosed piece of rubber is cut off from a sheet of Castilloa Elastica as turned out by the machine. You will see of what particularly good quality it is. The price of this apparatus is £6 10s 0d including five spare sieves.

Up to now there has been a great divergence of opinion as to the proper method of laying out plantations of Castilloa Elastica, and I have this week received some valuable information on the subject from several English gentlemen who have established large plantations in Southern Mexico. They tried the two ways of planting which are in vogue: first, planting out the young trees in places partly cleared in the forest, and secondly, planting direct in the open sunlight without any shade at all. The results are quite extraordinary. Those sown out in the open in full sunlight on July 1st, 1898, when measured on July 3rd, 1899, had a stem the circumference of which was, one inch above the ground, 5⅜ inches, the height of the topmost branch being four feet two inches. These measurements were taken from an average plant.

An average plant of 11,000 sown in the forest shade on July 3rd, 1898, measured on July 5th 1899, height between 12 and 14 inches, and the circumference of stem 1¼ inches.

What was particularly noticeable was that these plants, when transplanted into the open on account of their doing so badly in the forest, very soon died.

I trust by next mail to send you a photograph of the drawings, as a glance at this would show at once the extraordinary difference.—Yours truly,

GILBERT CHRISTY, F.L.S.

DIRECTIONS FOR USING THE "BETA" RUBBER MACHINE.

1.—The latex as brought in from the field must be mixed with 50 per cent. of clean water and then passed through a fine copper sieve to remove particles of bark, &c., &c.

2.—Pour the latex into the upper part of the machine or washer, turning the handle quickly. Have an assistant to pour in water continuously, so as to wash the latex through the wire gauze sieve which is fixed in the base, until the lower vessel is full. Then pass on to the next in turn, and fill up as many vessels as may be in use.

3.—The sieve must be removed and cleaned when required, by washing in clean water.

4.—Allow the vessels to stand until the rubber has risen like cream to the surface. When it is ascertained that the rubber has all come to the surface, draw off the

liquid from below, by opening the tap, until the liquor is seen to contain particles of rubber. Then stop and fill up again with clean water by pouring it into the aperture which carries it below the rubber at the base of the vessel. Perform this operation three or four times, or until the rubber rises white and clean. No loss of rubber occurs if the operator is careful to let the rubber all rise to the surface before drawing off the water.

5.—When the water is let off for the last time, some of the rubber will pass before the upper surface is sufficiently drained. This should be caught and returned to one of the vessels where washing is going on for the first time. The thickened cream or latex must now be poured into gauze sieves and set to strain over vessels holding water, so that no rubber may pass through and be lost, and this draining may also be returned to the washer.

6.—Allow the latex to stand in the sieves, occasionally filling up with washed latex until full. When fully drained the latex will coagulate of its own accord, and may be turned out in cakes or sheets. The drying of these sheets may be assisted by passing them through wooden rollers, and the sheets should be completely dried by passing through each a loop of twine, and suspending them in an airy place.

7. If it is required to hasten the process, a coagulator may be used, but better rubber is produced by simple evaporation.

8.—The parts of the machine must always be well cleaned immediately after use, as this operation becomes difficult if the rubber is left to harden on the sieve or the sides of the vessels.

9.—By keeping plenty of water with the latex during washing, any partial coagulation is prevented and a better class of product results. Latex mixed with water will stand without coagulating for 48 hours, without affecting the quality of the rubber produced.

10.—Rubber 9 produced by this process will keep longer, and, is of far better quality than by any other process, as all the matters likely to deteriorate the quality are removed by the frequent washing.

T. Christy & Co., 25, Lime Street,
London, England.

PLANTERS' ASSOCIAION OF CEYLON.

CEYLON TEA IN GERMANY: MR. J. H. RENTON'S REPORT.

Kandy Sept. 20.

Sir,—I enclose for favor of publication copy of Report by Mr. J. H. Renton on the subjects of Ceylon Tea on the Continent of Europe and the Paris Exhibition,—Yours faithfully,

W. D. GIBBON.

Bukeburg, 15th Aug. 1899.

My Dear Lane,—I shall be in Ceylon, I daresay, as soon as this reaches you; but it is as well you and the "Thirty Committee" should have a report on Ceylon Tea in Germany, as I have made exhaustive enquiries during my stay in Bremen, Hamburg and Berlin.

CONSUMPTION OF TEA IN GERMANY.

I was quite under the impression that the consumption of tea was increasing. It seemed to *me* to be more drunk. I have seen many more advertisements of tea than formerly, and that in the largest towns there are shops that sell only tea and coffee, seemed to me indicate a greater consumption of the article. The importers in Hamburg and Bremen, as well as the largest retail dealer in Berlin, assure me this is not the case. The importation of tea has increased, but this is entirely due to the increase in the population, and in fact that though the increase in imports has been an average one of from 10 to 15 per cent per annum for the past five years, the consumption per head, is not what it was 20 years ago. Though in Southern Germany the consumption may have grown a little, it has fallen off in some parts of Northern Germany, being displaced by beer and coffee. The reasons for the non increase in the consumption of tea are various—first during the past two years is the great cheapness of coffee. You can get good coffee ready roasted for 1s per lb.: this is after paying duty. The large turnover in coffee and competition compel the retailer to sell it fairly cheap. But in tea, there is a small sale and the retailer will not trouble himself with sale of the same unless he makes a good profit. In tea, the retailer must have his 33 per cent. the dealer his 15 per cent. and the importer his three per cent.; they won't work for less: there is a duty of 6d per lb. on tea. If tea is to reach the masses it must be retailed at lowest at 2s per lb., but with a 6d duty, and charges varying from 60 to 65 per cent. There is, you will see, not much chance of a *good* tea being sold at this price, how then can the frugal housewife get a good tea for 1s 6d? Second, the non-staying power of tea: the average German takes only coffee, rolls and butter, to breakfast. At 1 o'clock he is ravenous on tea, but if he has had coffee he goes on much longer. Third, the difficulties in the way of the preparation: fresh boiling water, and a 2d tea pot. Tea is in 99 cases out of 100 not properly made, and the man who has tried it, once and liked it, when on the second and third occasions he gets a bad cup, gets disgusted and goes back to coffee. Fourth, the large increase in the production and consumption of beer. My lady friends in Hamburg tell me that in the days of their mothers and grandmothers it was considered very bad form for a lady to drink beer in the evening; now although tea is always prepared and there 70 per cent. of the ladies drink beer and wine. As regards the

CONSUMPTION OF CEYLON TEA,

it is used and used entirely for blending. Both the importer and retailer are of opinion that it will never be drunk by itself. Our medium and common teas are not in it, they say with other kinds; they are flat and dull. Our good teas are liked, but are much too bitter and harsh to be drunk by themselves. The German Customs, in their returns, make no distinction in the country of origin. The largest importer in Bremen, gave me it as his opinion that about two-thirds of the total tea imported, was from China, and the other one-third Indian, Java and Ceylon; and he considered that Ceylon had fallen off during the past two years, owing principally to the fact that Indians and Javas were relatively of much better value. Java teas had improved immensely. Their leaf was always good, but the liquor instead of as formerly being mere dirty water, now contained both strength and flavour. I myself was much surprised to see what very good teas indeed were being

SENT FROM JAVA.

This importer was emphatically of the opinion that Javas and Indians lent themselves much more easily for blending purposes than Ceylons. He dilated, and so did every one, I met on the non-keeping quality of Ceylon tea. This is an old and general complaint and I think it would be really worth our while to try, if Mr. Bamber can give us any help on this point,

Another importer placed the consumption of Chinas in Germany at three-fourths of the total import,and other kinds one quarter only. As regards a campaign for the pushing of Ceylon Tea in Germany, I found all the importers indifferent and some of them distinctly hostile. Some of them (personal friends of my own) seem to regard my mission as one meant to take the trade out of their hands and to transfer it to the retailer and wholesale dealer. My assurance to the contrary seemed at first to have little effect. I assured all these men that I wanted to work with the trade, and through the trade entirely. After a deal of conversation, I believe, I have got

TWO HAMBURG IMPORTERS,

and one Bremen one, to work with me. The two former will think the matter over, while the Bremen man is to get a series of well-written illustrated articles put in the illustrated newspapers, and further short articles in the other papers. I am to send him a supply of photos for this purpose. I have made it clear that we are quite as willing to assist their clients to advertise Ceylon Tea, as we are to assist Hagenbeck & Co. Hagenbeck's advertisements have evidently made a great deal of impression, but most of the importers think it is money thrown away, and hold that the immense amount of money spent will not be compensated for by the amount of business done. However, the very fact that his advertising has drawn the attention of the whole of Germany to him and his tea is significant.

HAGENBECK AND CO., BERLIN, AND THEIR WORK,

This firm have taken up Ceylon Tea, and pushed it on through business lines and with a vast amount of energy. They have only an office in Berlin, their warehouse is in Bremen, as is also their packing establishment. Their mode of work has been as follows:—Their travellers have visited 67 big towns in Germany. Prior to his arrival the town is placarded with posters and the dealers in that town and district receive musters of his teas. In every district he has now an agent or rather dealer and the dealers and travellers in turn take his teas round to the grocers. He works in tea and Ceylon Tea only. In addition to the 67 large towns his travellers have visited 37 smaller towns in Germany. I have of course not been able to verify this statement about the travellers, but their books show the following expenditure from time they started till 31st July:—

			Marks.
(1) Placards in 67 towns. Advertisements in 31 papers. Cost of postage 165,000 for samples. 275,000 post cards with views. 100,000 circulars. Six particular posters. 3,000 transparencies. 40,000 post cards from Colombo	...		4,2700
		Marks.	
(2) Two travellers	...	14,000	21,100
Three Warehousemen	..	3,500	
Two clerks	..	3,600	
(3) Rent of Warehouses in Bremen. Offices in Berlin. Furnishing of do. do.			6,600
(4) Purchase of 92,000 lbs. tea	...		40,000
			110,400

or say £5,520 or in advertising alone £2,135, against which we have given them £750. (Since this was written payments have been given for £907 1s. 0d. being one-third of £1,154-7-5 and one-third of £1,566-15-6, in addition to the £750 grant, 5,000 lb. of tea for free distribution and R2,875·24 for duty.

		Marks.
Receipts:—		
£750 from Thirty Committee	..	15,000
Sales of 30,000 lb. tea	..	14,000
Profit on do	..	1,400
	..	30,400
Deduct receipts from Expenditure leaves a balance of	..	80,000
Less value of 15,000 lb. tea sold but not delivered, and 47,000 lb. tea bought, but not sold	..	26,000
		54,000

or £2,700. being balance of money imported by Hagenbeck & Co. in first nine months. In other words they have up to date put £4,000 into the business. They are strongly of opinion that they must go on with their advertising and think it would be unwise to stop. I have pointed out that all those other articles of consumption which are so extensively advertised give a large profit to the manufacturers probably over 100 per cent—and they can well afford to advertise, but that our funds are limited and that we do not profess to advertise to this extent. Herewith summary of their estimate for six months advertising to be undertaken now:—

		Marks
Advertising in six illustrated papers with a weekly issue	...	6,336
Eight ladies' papers appearing every fortnight	...	4,272
24 daily papers once a day	...	7,322
For special advertisements for grocers in their own provincial papers	...	9,000
Placarding towns ...	...	12,448
25,000 large posters ..	..	1,125
19,000 small do ..	...	1,140
12,000 inside do ..	..	1,800
12,000 transparencies ..	..	840
40,000 samples and postage	..	10,000
300,000 post cards ...	..	2,700
200,000 pamphlets (Bamber's)	...	6,000
	M.	62,983

or say £3,149. I have pointed out that we are quite ready to give one-third of this sum. They affirm that this is not sufficient and that they cannot risk more of their own capital. I have replied we cannot possibly devote such a large sum as this to him alone next year. I see from the Report of the Committee that a sum of £2,000 has been voted *this* year for Germany and that out of this Hagenbeck & Co. are to receive £1,500. I do not know, if this is in anticipation of more advertising on their part or in payment of part of the money M. 42,700 £2,135) already spent by them. If this be the case, I think, Hagenbeck should receive other £500 next year in 1900—making a grant of £2,000 to them on account of their expenditure for advertising in '98 and '99—which will amount to a total of £5,284. See my private letter which accompanies this for fuller information as to this firm. For we must reserve £500 at least next year, for the importing houses in Bremen and Hamburg if they want it. Hagenbeck & Co. are particularly anxious to have some sort of official appointment. They have tried to take advantage of the present of tea to the troops to obtain contracts with some regiments, but unless they can shew that they are special agents for the Planters' Association, or the Ceylon Government, they will be regarded as swindlers, they say—I know how much importance some official recognition gives in Germany, but we do not do

this sort of thing in England, or Ceylon, and I must confess I do not see how Hagenbeck's wishes are to be met.

CEYLON TEA AT THE PARIS EXHIBITION.

I have had a long interview with the manager of Messrs. Lipton, Limited, tea Department. He has agreed to sell and advertise a blend of pure Ceylon tea, to advertise *Ceylon* tea extensively at his tea house and all over Paris, and to appoint agents all over France for the sale of his teas and Ceylon teas. In addition to the Blends of Ceylon Tea, he is to sell a Blend of Ceylon and China, and he is to give a guarantee that this blend will contain 50 per cent of Ceylon tea. If he carries out these promises, I have agreed to give him a grant next year, for advertising purposes. We must never forget that Ceylon tea made its way at first in Great Britain by being mixed with China, and I think we must follow suit in France and Germany, but at the same time get men to advertise *pure* Ceylon tea and keep it asked for.—Yours very truly,

(Signed) J. H. RENTON.

F. G. A. LANE, Esq.

DUKWARI (CEYLON) TEA PLANTATION CEYLON.

The Directors have pleasure in submitting the accounts for the year ending June 30th :—

The balance of profit and loss account, after writing off ten per cent. Depreciation on value of machinery and buildings, is £2,914 8 4

which the Directors propose should be applied as follows :—

(1) In payment of seven per cent. Dividend on preference shares..	£840 0 0	
(2) In payment of seven per cent. Dividend on ordinary shares ..	560 0 0	
		1,400 0 0
Leaving		£1,514 8 4

to be carried forward to next year.

The returns of crop have been 277,408 lb. tea and 10,012 lb. Cardamoms. against 229,670 lb. tea and 12,655 lb. cardamoms last season. The large increase in tea is to be attributed to the free use of artificial and bulk manures.

The estimates for the coming season are 300,000 lb. Tea and 12,000 lb. Cardamoms.

The only Capital Expenditure during the year has been the purchase of a Roll Breaker and Sifter, costing £5 15s. 20d.

Mr. Spence retires from the Direction by rotation and. being eligible, offers himself for re-election.

The Auditors, Messrs. Brown, Fleming and Murray, also retire, and offer themselves for re-appointment.

CEYLON TEA IN MELBOURNE.

ALFRED HARVEY & CO.'S REPORT.

CEYLON.—Shipments from Colombo are 6,980,000 lb., as against 6,410,000 lb. at same time last year. Locally, arrivals have not been heavy, but have been painfully lacking in flavour and character, and in combination with high lay-down costs have been difficult to move. The want of careful manufacture has again been decidedly in evidence. The latest shipments, however, have contained a few breaks with good point, which indicate improved production. The market in Colombo is reported to have made a strong advance in sympathy with London buying and the increased demand from all parts of the world. Stocks in bond on the 16th instant were 449,986 lb. In Sydney during the month imports consisted principally of low to medium broken pekoes, ruling from 7½d to 9d; the few lines showing quality realised full rates from 11d to 1s 1d. Pekoe souchongs and pekoes were not in full supply, and were neglected by buyers in favour of Indian leaf, which showed better value in comparison.—Sept. 27.

PRODUCE AND PLANTING.

PLANTING IN CENTRAL AFRICA.—There are worse places for planters in some respects than British Central Africa. Of course capital is wanted, but the labour market is the cheapest in the world, the rate being about three shillings a month—paid in calico. Land is cheap, and will grow anything, and give enormous crops. On the other hand, it cannot be said to be a healthy country. There is a heavy, continuous rainfall for six months, the climate is malarious, and as black-water fever is prevalent, the death-rate is high. Whites fare well; Indian cooks, veritable chefs, are employed. There is no variety in the food, the staple is "chicken," but the game is excellent. Order is kept by a stand army of 300 Sikhs with white officers. The Deputy Commissoner commands the British Central Arican Rifles, which consist of two battalions of natives, one of which is at the depôt in Mauritius. The best coffee in the world comes from Nayasaland; it fetches the highest prices, and so does the tobacco. The planters are mostly Scotch. A good deal of rubber is also finding its way through the Protectorate from the Chartered Company's territory north of the Protectorate.

TEA RETAILING DODGERS.—The competition in tea retailing must be acute indeed, judging by the dodges resorted to for the purpose of inducing sale. "The Grocer" refers to a circular issued by a gentleman who announces that he has just returned to the home of his parents. His relatives were generous to places of worship, one of their gifts being an organ." Having come to reside in his native town he trusts his fellow-townsmen—especially Christians—will buy his "fine teas." It is his intention not to call for orders unless requested. In another instance somebody's brand of tea is referred to, to push the sale of which the "somebody" is "giving away" £300 in money prizes. The tea ranges from 1s 4d to 2s 8d per lb. and senders of the first forty orders opened each morning will have the amount sent returned with the goods, and two or three shillings to boot.

PLANTING TROUBLES IN BRAZIL.—Financial trouble in Brazil is having a serious effect on the coffee industry. The rise in the value of the milreis and the uncertainty of the power of the Government to maintain it paralyses trading in every direction.—*Home and Colonial Mail,* Sept. 29.

"ALL ABOUT RUBBER."—The further title of this handbook mentions that it deals with "all varieties in all countries, with harvesting and preparation, and gutta-percha." Therefore, Mr. J. Ferguson has launched out upon a large and important subject, with which, as editor of the *Ceylon Observer* and the *Tropical Agriculturist* he has proved himself qualified to deal. The volume is destined to be the India-rubber Planters' Manual, and it "includes the latest statistics and information, more particularly in regard to cultivation and scientific experiments in Trinidad and Ceylon." Having mentioned the scope of the book, and the fact that Mr. Ferguson may be trusted both as regards original writing and the sources from which he draws his quotations, it is merely necessary to add that all directly or indirectly interested in the India-rubber industry must acknowledge the convenience of obtaining so much valuable information in a handy form. Publishers—London: J Haddon & Co.; Luzac & Co.; Kegan Paul, Trench, Trubner & Co. Also issued from Colombo, Singapore, and Java.—*Gardeners' Chronicle,* Sept. 16.

INDIAN AND CEYLON TEAS.

The popularity of British-grown teas is ever increasing with almost phenomenal rapidity, ousting China teas from the position they have occupied for so many years. The planters of India and Ceylon are far-seeing men, and, recognising that unity is strength and dissension commercial suicide, they have coalesced to conquer the world, and seem in a fair way to success. They have imposed upon themselves an export tax which is devoted to fostering the trade in their teas in countries in which they have not yet established a firm footing, and where they are comparatively unknown. Thus, in North America, two Commissioners, representing India and Ceylon respectively, were appointed, and, working harmoniously together, they have done splendid service. The merits of British grown teas have been persistently kept before our American cousins and Canadian brethren by means of advertisements and subsidies to firms who have taken up the trade. Blends containing Indian tea mixed with the long-known China variety were found to sell well, and as the proportion of Indian increased, so did the demand. The result of this wisdom and push is that British teas (bounty-fed, by the way) have a firm held upon the North American markets, from which they are steadily driving China. The following table of imports gives some idea of the strides made in the use of Indian and Ceylon teas in North America of recent years :—

	1898. lb.	1897. lb.	1896. lb.
Indian ...	5,972,000	5,663,000	5,259,000
Ceylon ...	7,637,000	5,699,000	4,365,000
Total ...	13,609,000	11,362,000	9,624,000
	1895. lb.	1894. lb.	1893. lb.
Indian ..	4,072,000	2,428,000	2,111,000
Ceylon ...	3,745,000	2,295,000	1,871,000
Total ...	7,817,000	4,723,000	3,982,000

From this table it will be noticed firstly that the total exports of tea from India and Ceylon to North America have more than trebled in six years, and secondly that the produce of Ceylon meets with more favour than that of India.

We have taken North America to illustrate the pushfulness of the Indian and Ceylon exporters, because for the past few years special attention has been devoted to the trade there. Efforts are being made to develop the business in other countries, but not on such broad and liberal lines. The following table, however, shows very clearly that the tea exported from these countries is making rapid strides in Foreign and Colonial markets, exclusive of North America :—

	1898. lb.	1897. lb.	1896. lb.
Indian ..	20,058,000	16,536,000	13,947,000
Ceylon ...	28,763,000	23,250,000	19,101,000
Total ..	48,821,000	39,786,000	33,048,000
	1895. lb.	1894. lb.	1893. lb.
Indian ...	12,743,000	11,722,000	11,916,000
Ceylon ...	16,167,000	12,268,000	11,268,000
Total ..	28,910,000	23,990,000	23,184,000

Here again it will be noticed that the consumption of Ceylon teas is greater than that of Indian.

[Reference is then made to Russia but the information is scarcely up to date.—Ed. *C.O.*]

In the rest of Europe, in Australia, in fact all over the world, the same constant increase in the consumption of the tea grown in our great dependency, and its friendly rival Ceylon is found. It is even the case in China itself.

At home again we find the demand ever increasing, at the expense, to some extent, of China, although the total consumption of teas of all kinds is also growing. We append a comparative statement of deliveries in the United Kingdom for home consumption only.

	1894-5. lb.	1895-6. lb.	1896-7. lb.
Indian .	113,500,000	121,000,000	123,750,000
Ceylon .	71,500,000	76,000,000	83,500,000
Total .	185,000,000	197,000,000	207,250,000
China and other teas	30,000,000	26,000,000	24,000,000
Total .	215,000,000	223,000,000	231,250,000

	1897-8. lb.	1898-9. lb.
Indian .	127,500,000	128,605,197
Ceylon .	87,000,000	90,108,167
Total .	214,500,000	218,713,364
China and other teas .	20,500,000	21,569,953
Total .	235,000,000	240,283,317

The totals given above do not, of course, represent the imports into the United Kingdom; a large quantity in addition, which in 1894-5 was about 31 million pounds, and in 1898-9 was 33,400,398lbs., is re-exported every year.

A source of annoyance is the import duty, both in England and America. In this country the duty amounts to 4d per lb., and the Chancellor of the Exchequer derives from this source the comfortable sum of something over four millions per annum. Coffee, on the other hand, pays only about 1d per lb. in import duty, and the spirit of the tea-importer rebels against this "partiality," but in view of the fact that fourpence a pound is in itself a moderate duty, and that the impost on tea and tobacco are the only means of obtaining any sensible contribution from the temperate working man towards the expenses of the Empire, it seems unlikely and undesirable that any further decrease should be made. In America, also, coffee is more kindly dealt with than tea, and this was particular the case during the war with Spain, when a war tax of ten cents was charged upon every pound of tea imported. With the great reduction of the duty in recent years, there has been an immense impetus given to the cup which cheers and the hearts of good Imperialists especially rejoice at the knowledge that British gardens supply the great bulk of the tea tables of the world with fragrant leaf.—*Investors' Guardian*, Sept. 23.

Mr. Alex. Whyte and Uganda Clover.—The Uganda clover is an ally of the widely dispersed *trifolium repens*, which it closely resembles, and was originally discovered by Sir Harry Johnston of Kilima N'jaro at 10,000 ft. in 1885, and has been found to be common by Mr. Scott Elliott at Kikuya at 5,000 ft. to 6,000 ft. A supply of seed has now been sent to Kew by Mr. Alex. Whyte, F.L.S., curator of the botanical station, Uganda, [late of Ceylon. —Ed. *T.A.*] who writes that it is a splendid plant to introduce into the hill pastures of tropical countries, as the pastures of Kikuyr in which it flourishes are very rich. Seed has been distributed for trial in the colonies and elsewhere, and the results will be awaited with interest by all those interested in tropical pastures at high altitudes.—*Chronicle*, Sept. 15.

LONDON CHARGES OF TEA COMPANIES.

Under this head the "Investors' Review" is publishing a series of articles. We give the first of these, taken from the issue of September 16 :—

There is little doubt that the tea-grower is feeling the pinch of hard times rather severely. Under ordinary circumstances such a development as the rise in the Indian exchange from 1s 0½d to 1s 4d per rupee, with its concurrent advance in the cost of production in India and Ceylon, would have heen accompanied by some improvement in the European price for tea that would have served as a mild offset to the increased expenditure of the planter. The mania, however, for extensions some years back has quite put this natural remedy out of the question, for the knowledge of the enormous area of tea plants coming to Maturity, combined with the larger quantity of tea sent to market, has the effect of preventing any recovery. Consequently the average price of 8¾d. per lh. for last season was no higher than the average price obtained when the rupee was at its lowest, although last season was favoured by a little "boom" in the spring as a result of the accidental circumstance that for two seasons in succession the Indian crop as a whole had been poor in quantity. Anyone acquainted with the real position of the industry feels that if only the average yield per acre returns to its normal figure, a further decline in the price of tea must be faced.

This may he taken as an axiom, admitted but not talked ahout, by tea growers, and profits having been seriously eaten into already by the course of events, there has been a great searching to find economies that would in some respects guard producers against a further decline in price. Expression of this quest was visible in the campaign against the "draft" which ended so disastrously to the producers, and, the wiseacres of that body having had their turn, some of the practical members amongst the tea-growing community are now beginning to raise their voices. As things stand, where the chief evil is over-production, economies must be looked for rather from within than from without, for the buyer knows he is in the stronger position, and he should therefore be cosseted and soothed rather than talked to with a cluh. But economies from within, in the shape of stopping leakages in profits, reducing extravagant charges, and rendering unnecessary too much manipulation of the article produced, are just those reforms that lie open to every tea grower, and the closer he studies the minutiæ of his business the more he will fend off the reduction in his profits. Every decimal point per pound saved in cost of production and charges relating to tea is so much in his pocket, which he is more likely to save than if he attempted to put up market prices against the buyer.

Regarding the outlay on the estates, we cannot speak with knowledge, for that expenditure is of such a special character that experts alone can give an opinion worth having. As a matter of fact, however, we believe it is admitted that as, generally speaking, this expenditure has been steadily reduced, if allowance be made for change having risen, salaries have been cut down, more economical forms of working have been adopted and in other ways prime cost of production has been lowered. Whilst this has heen done of late years, there has been a growing discontent with the burden of London charges, which range from a little over 1d to 1⅝d per lb., and these charges upon an average price of 8¾d for Indian tea and 8d for Ceylon tea appear to constitute an excessive burden. They mean that the Indian planter has 7d per lb. left with which to pay all working charges close down to the arrival of the tea at Calcutta and evolve a profit for himself, which the Ceylon producer has even less of a margin. Before we go further, we ought to say that in many cases the burden of the London charges is rendered unnecessarily heavy by the management at the estates. If the tea is not properly hulked hefore leaving the estate so that a break of chests of one grade differs materially in quality, "bulking" has to he conducted in the warehouses in London, and although this charge is said to be unreasonably high, the process necessarily must be costly, for all the chests have to he opened, their contents spread out, and mixed one with the other, in order to produce a tea of equal quality throughout the break. And the warehouse responsible for this work, if it does not do it properly, and it is often not done well, takes care than the samples taken shall not be from the best part of the tea, for in that case the buyer has a remedy against the warehouse, and this hulking in London, therefore, tends to hinder the tea-grower from getting quite full credit for the quality of the tea he sends. Then, again, tea loses in value hy being handled, and the weight suffers from the same cause.

Another fruitful source of loss arises to the planter if he does not make the weight of his tares equal, the bare weight, that is, of the packages in which the tea is sent. If this precaution he neglected, the tea has to be "tared" in the warehouse, which means that the chests, or a certain proportion of them, are taken, the tea turned out, and the empty packages then weighed. The charge for doing this is also high, and, again, the loss in weight and damage to the tea is considerable. A saving can also he effected by so packing the tea that it takes less space in the ship, and thus reduces the cost of freight.

To give a concrete example of what attention to these details means, and also in elucidation of remarks to be yet offered about warehouse charges, we give the following examples of two shipments of tea hy small Ceylon concerns, and the London charges upon them. The first example is one where the cost was low, amounting as it did to under 96d per lb. The names of the estate and of the ship are quite fictitious, although every other detail is copied with strict accuracy

ROTALE ESTATE CROP, 1899.

Report on Outturn of 113 Packages Tea ex Oceana.

Averages :—	d.
10,524lb. sold, grossing £319 11s 1d =	7·29 per lb. gross.
10,640lb. shipped, netting £280 9s 9d =	6·33 per lb. net.
116 Loss in weight and charges =	·96 per lb. Equal to per lh. on Shippng weight.

	d.
Loss in Weight—	
Draft at 1lb. per package accounts for 113lb. and the actual shortage is therefore 3lh.	
Draft and actual shortage equal 1·09 per cent on shipping weight ...	·07
Freight—	
Rate, 25s Meast. 565. Amount £14 2s. 6d. Equal to 94lb per 50 cublic ft. on shipping weight	32
Dock and scale charges—	
Amount, £15 7s 1d.	·35
Brokerage 1 p.c., and commission 2 p.c.	
Amount, £9 11s 9d	22
Remarks—	
All grades passed on an average tare.	
Total charges and loss in weight per lb.	·96

In the above example all grades were passed on an average "tare," so that the tea did not have to be handled before it was sold. The result was that, allowing the 1 lh. per package for draft, the loss shown upon 10,524 lb. in the shipment was only 3lb., a mere nothing.

Turning to another shipment which passed throngh the hands of the same agent, but from another estate, wo find the result very different :—

BINGOLE ESTATE CROP, 1899.

Report on Ontturn of Packages Tea ex Wakera.

Aveages :—	d.
2,620 lb. sold, grossing £103 14s 2d	=9·50 per lb. gross.
2,728 lb. shipped, netting £91 13s 2d	=8·06 per lb. net.
108 Loss in weight and charges	=1·44 per lb.

	Eqnal to per lb. on shipping weight.
Loss in weight :—	*d.*
Draft at 1 lb. per package accounts for 44 lb., and the actnal shortage is therefore 64 lb.	
Draft and actnal shortage equal 3·96 per cent. on shipping weight	·38
Freight:—	
Rate, 25s. Meast., 124·8. Amount, £3 2s 4d. Equal to 1.091 lb. per 50 cubic ft. on shipping weight	·27
Dock and sale charges.—	
Amount, £6 6s. 7d.	·56
Brokerage and commission :—	
Amount, £2 12s 1d.	·23
Remarks :—	
Each package tared involving heavy dock charges (tares 14—18 lb). Loss in weight is probably due to the same causes.	
Total charges and loss in weight per lb.	1·44

In this shipment there were only forty-four pacakges and so the loss in weight from the draft was only 44 lb., but, as a matter of fact, 108 lb. was lost out of the total amonnt of 2,728 lb. shipped. Some little proportion of this was due to general causes, such as drying on journey and weeping, but the main reason was the fact that every package had to be tared at the warehouse. The shortage of tea on the shipment thus came to ·38d per lb., instead of ·07d per lb., as in the first example. Tariug also added to the warehouse charge materially, this representing ·56 per lb., as against ·35d per lb. in the first example. The only respect in which the Bingole shipment compared favourably with that from Rotale was in that it was so packed as to allow 1,091 lb. of tea to be got into 50 cubic ft. on board ship, as against only 941 lb. per cubic ft. of the Rotale tea, the difference representing .05d per lb. in the freight charge. The net result was that the London charges for the tea from the Bingole estate totalled 1.44d per lb., as compared with only .96d per lb. upon the tea from the Rotale estate. And probably the tea from Bingole was not in such good condition for selling at the end as that from Rotale. Whilst, therefore, we are not blind to the faults on the side of the planter and his assistants which contribute to keep the London charges heavy, we must confess to a strong opinion that he is in some respects unjustly treated. Let us analyse those London expenses as set forth in the examples given above. The loss in weight, after deducting the "draft," is a matter, as we have shown, very much in the planter's own hands. Then comes ocean freight, which is a charge very much ontside his control. Freights vary at times from abont 20s to 40s per ton, and their rise and fall are governed by many conditions quite outside the tea trade and that trade cannot be expected to receive special consideration from the shipping firms. The examples we give show a frieght rate of 25s per ton, and we believe the present charge is 30s per ton. Next comes dock and sale charges. These are the warehouse charges about which there is so much complaint just now, and finally we have brokerage and commission. These latter embrace the usual one per cent to the broker who sells the tea and two per cent to the agents, the latter covering office expenses and secretary's salaray, if the concern is a company. The warehouse charge of 35d per pound does not look heavy to an outsider, and in the example we have given it is rather low, the average being nearer 40d per pound, when no special services have to be rendered. When, however, millions of pounds of tea have to be handled in a year, this apparently infitesimal charge amounts np to a considerable total, and we have good gronnds for stating that it is nnduly high. Space will not now permit us to enter npon our reasons for this opinion, bnt they shall be set forth in another article—*Home and Colonial Mail*, Sept. 29.

MR. CARRUTHERS' ARTICLE IN THE "CONTEMPORARY REVIEW."

In the October number of the "Contemporary Review," Mr. J. B. Carruthers makes a brief, and closely reasoned, appeal for more Plant Doctors. By this term he does not mean herbalists or dealers in "simples," but doctors for plants, competent to prescribe for their ailments, like the physician or surgeon for man, or the veterinary practitioner for animals. This, as a science, is now ,belonging almost exclusively to the latter part of the century. In our own country it has little encouragement, and naturally but few followers, of whom not all have been trained in the right way. Yet botanical therapeutics is an important subject and one obviously difficult; in some ways more difficult than in the case of men or of animals. The former can tell the doctor what they feel, and the more caretul among them often take note ot early symptoms, and consult him before a disease has become formidable. In the latter case, shepherds and herdsmen, carters and farmers, note incipient ill-health in the animals under their charge, and are able to send for the doctor in good time. But the plant not only cannot say what is going wrong, but also is often more slow in showing the symptoms of disease. Greater, too, are the difficnlties of treatment. Surgery, no doubt, is a simpler matter, and experiment has a free field in vegetable pethology. The most zealous antivivisectionist has not yet protected against operations on "poor dumb plants." But this is their doctor's only advantage. His subject cannot swallow medicines ; in it there is nothing analogous to the blood system of animals which helps him to convey remedies to all parts of the patient's body. External applications alone are possible, like salves, poultices, and embrocations. Besides this, many diseases of plants are dne to injurious organisms which have not very different life conditions, and the remedy which is fatal to the parasite may be eqnally so to the victim. To prove the accuracy of a diagnosis by means of a *post-mortem*—though a pupil once made this boast of his professor—would scarcely tend to increase a practice. Another drawback is that the doctor, as a rule, is not called in till the patient is dying or dead. Now, *post-mortems* are all very well in their way, but the subject is more often sent to the pathologist than he is called to the patient, and often arrives in such a state of decomposition as to be of little use. Doctors, as Mr. Carruthers remarks, wonld not find it easy to discover remedies for diseases if, when they were summoned, the patients were either *in extremis* or dead, and, perhaps, a good deal more than that. Even when the malady had been ascertained, and a remedy found, plants present many difficulties which living creatures do not. Thus,

for contagious or infectious disease the patient is isolated, but most cultivated plants are crowded together, often under unnatural conditions. Pot flowers in a hothouse may be sent to a hospital, but this is not easy in the case of those in a garden, and impossible with trees in a forest. Some progress has, undoubtedly, been made in vegetable therapeutics, but Great Britain, as is too often the case, is left behind in the race of investigation. Germany and America both spend money liberally on promoting the scientific study of plant diseases. In England the workers are few and their time often occupied by other duties. The officials at the Royal Gardens, as we learn from the "Kew Bulletin," do their best; and as much is true of the British Museum and some Universities, Colleges, and Societies. But much more is wanted, and as it seems hopeless to look to the State, the beneficent millionaire is needed to found a school of plant pathology. But, it may be asked, what is the good of it; *Cui bono*, except to the endowed investigator? Mr. Carruthers answers the question. The cure of phylloxera in vines, of canker in trees, of many diseases in field crops, all mean money. The Department of Agriculture in the United States estimates the annual loss by plant diseases at forty million pounds, and the gain to peach growers in California alone, due to the cure of a disease in that fruit tree, is worth one hundred thousand pounds a year.—*Standard*, Sept. 29.

THE PARIS EXHIBITION.

THE CEYLON SECTION.

A visit to the Agricultural School—and it is a very pleasant drive there in the early morning—will enable Colombo residents to gain an idea of what will be the character of the Ceylon Exhibits, although the specimens of tea are not yet sent in. We need not go into particulars of these, all the details will be published in due course, and the exhibits may (in advance) be described as thoroughly representing Ceylon tea, grown under all circumstances. No district has seriously refused to contribute, though some temporarily did in connection with the Dreyfus protest. Each box of tea will have on the outside the name of the estate, the grade and quantity, the name of the district, estate, exhibitor or agent, quantity and quality obtainable, and the price. The elevation of the estate is also to be given, and its rainfall. All exhibits are to be sent in by December 15th. Mr. Renton and Mr. Davidson are entrusted with the final duty of submitting tea samples to the Tea Jury.

At the

AGRICULTURAL SCHOOL

there are now arranged, though mostly kept under lock and key, a series of exhibits which will well illustrate the industries, the attractions and the resources of Ceylon. The series of photographs by Mr. H C P Bell, C.C.S., our well-known Archeological Commissioner, of the Ruined Cities, the excavations and their surroundings are familiar, having been on view before. They have been prepared for exhibition by Messrs. W L H Skeen & Co., and with them is associated a well-arranged series of views from the studio of the Colombo Apothecaries' Co. In close proximity we find the loan collection of

MALDIVIAN CURIOSITIES,

placed at the disposal of the Committee by Mr Haly, and, those who look into the articles exhibited, will be pleased by the excellent lacquer work. The Conservator of Forests, Mr. Broun, gives specimens of trees (hora, del, mango, kina, calamander, and others), cut from trunks in most cases, which show that the forests of Ceylon (when cheap transport facilities are devised) can vie with other countries in the production of timber suited for those in the branches of carpentry requiring high and careful polish, and the durability of a hard surface. In this connection specimens of carved work (all from the hands of Sinhalese men), exhibited by Messrs. Don Carolis & Sons, are especially interesting. A carved ebony flower stand, an ebony clock stand, a tamarind wood carved chair, porcupine quill chairs, &c. Here we also saw a collection of native woods (sixty-five in number) made at the request of the A.G.A. of Kegalla by Mr. Elapata, Ratemahatmaya. Mr. Kellow, of Nuwara Eliya, has kindly aided by sending specimens of the Acacia decurrens, and its bark, in several varieties, and close to, handed down from a date not given, are two Kandyan wood pillars, carved grotesquely, and skilfully. They are lent by the Museum authorities, and are amongst the most interesting features (from an archæological point of view) of the exhibits. Mr. Kellow again helps in regard to a collection of coffee sticks, which have been worked up into various articles carefully carved, and beautifully polished. By the side of these is placed, temporarily of course, the trunk of a kitul palm tree.

MINERALS.

This is no summary of what will be shown of the mineral wealth of the island and we enumerate only the specimens received at the present time. Mr. Kellow, of Nuwara Eliya, has contributed specimens of limestone and blue spinel. Other interesting blocks and fragments are sent from Kegalla, from which come specimens of crystalline rock stone, white stone and limestone.

With Ceylon the occupation of

FISHING

must always have a prominent place, and which it has retained up to the present day as a purely native industry. In this connection the collection of boats of the kind that float around our shores, and on our rivers, lakes and lagoons, is of great interest. Fourteen models are shown of boats, and specimens of nets and other fishing appliances are also given, which are well worthy of observation, though we fear that in the Ceylon Court at Paris they will escape observation, unless they are well-displayed. The fishing appliances sent by the gentlemen, who have had the 'Veddah' department in charge, are unique in their character. The nets, the spears, and other weapons used are very singular. The model of the pearl-fishery boat (built by the order of Capt. Donnan) has been already referred to, and in this connection we should note the specimen of pearl shells sent from the Eastern Coast. The large Tambalagam shells have been mounted so as to form the wings of a beetle.

OILS,

too, come in for a share of attention. Our readers will remember the specimens of oils exhibited at the Colombo Agricultural Show by Mr. Warr. These are to be sent, and with them are placed 'wild' oils sent by Mr. J. A. Nugawella, Ratamahatmeya of Kegalla, and beside these there are essential oils forwarded by Messrs. Coates & Co. of Galle, as well as Anatto seed oils, which

have been received from Mr. Van Starrex. In addition to these, oils have been forwarded by the G. A. of the North-Central Province. There are, too, cases of arecanuts illustrative of their uses, some of which probably come under this head, and show what can be done with this product. In connection with this and the other departments a case of oils (open to visitors) will be shown for testing purposes.

Resins are sent from Anuradhapura: para and ceara rubber from Heneratgoda gardens, though there is room for improvement in the latter, not so much in regard to quality, as to the form in which they are to be exhibited, for the specimens admit readily of attractive design and this is at absent present.

In drugs there is much to interest. The Government Agents and the Assistant Government Agents of the various provinces are still at work and are sending in collections illustrative of the medicinal resources of the island. To the uninitiated visitor these exhibits will be "mere rows of bottles," but to many, we hope, there will be light thrown on the resources of a colony like Ceylon. The Government Agent for the Western Province sends in four cabinets which will when complete contains 360 varieties of drugs, all prepared from native recipes, and for each of which in the native *pharmacopeia* (unpublished we believe) there is a distinct use stated.

A small case, sent in by Don Gregoris Kappura Bandara, contains specimens of 200 cases of medicinal oils, all the products of Ceylon plants, &c. Another feature, too, is Mr. Stouter's specimen of plaintain flour. The production of this flour in the West Indies is developing into an industry of some importance, and why should it not find permanent root in Ceylon, especially in connection with a food-consuming population like that Australia boasts of.

In regard to

AGRICULTURE

there is a very interesting collection, made in miniature at the instance of the Government Agent of the Western Province, of Sinhalese implements of agriculture, in reference to which a good deal might be written. There is here need again for effective arrangement, combined with judicious colouring, but in any case to the curio-hunter the collection will prove of more than passing value. The model of Peradeniya Tea Factory has been before described in these columns. It was exhibited at Chicago and has been thoroughly renovated so that it will show to our French neighbours the manner in which tea is manipulated in Ceylon at the present date.

Nor must we forget in the enumeration of the specimens the results of hunting and the specimens of

GAME IN CEYLON.

It is too early yet to speak of the big elephant, which is being taxidermically treated at Kurunegala: and of the many other specimens that we could refer to, which are hereafter to be received. We can only just name the horns and skins sent by the Government Agent of the Eastern Province of spotted and barking deer, elk, and also cheetah skins. From the Central Province have been received, not only specimens of the Veddah costume (if it can be so described), but also of their implements and weapons of hunting, fishing and otherwise gaining a living. Amongst the curious things shown are the bags of bark skilfully torn in their entirety from trees (*riti* generally), and gourd bottles.

Minor industries in Ceylon (though we do not make anything but a rough calculation as to what should be classed under such a heading) include: baskets and mats sent by Mr. J. A Weerasinghe, of Kalutara: carved coconut shells of fantastic design and with very interesting results: edible bird's nests (sent by Mr. Kellow): carved ivory handles for fans (well finished but too heavy for actual use); cloths from the Eastern Provinces, the work of hand-loom weavers: brass work from Negombo district (an industry that needs developing): double coconut shell lent by Mr. Plâté: fan, made of wood work with paddy interwoven in a very interesting manner.

THE MODELS

of Mr. Rost we have already referred to, and they are not amongst the exhibits at the Agricultural School, as they will be packed and despatched from the studio at De Soysa Buildings. There are, however, comprised in the latter complete costumes of natives, including a Tamil Chetty, and we may add that Mr. Andriesz, sculptor, will make models, taken from life, of Veddahs. Under instructions from the Government he has gone to the Veddah Country to prepare them.

But among the more interesting specimens of Ceylon industries, should be included the specimens, representing what may be fairly claimed to be amongst the

ART INDUSTRIES OF CEYLON

The calamander, ebony and tortoises-shell boxes shown, inlaid as they are with ivory, all admirable specimens of island workmanship. In one there are miniature representations of the conquest of Ceylon by Wijayo. At the instance of Mr. Lane, the mountings of the album presented by the Planters' Association to the Emperor of Austria, will be placed in a frame of velvet. The specimens of Kegalla workmanship in silver, including as they do models of a dagoba, and a jubilee amblam, as well as a salver, are very striking. A carved egg-shell (set in ivory) is also noticeable, while Meedeniya Ratemahatmaya of Kegalla has shown (in miniature in some cases) the silver apparatus used by a wealthy betel chewer,—a case of instruments that will repay a half-hour's scrutiny. Then there are specimens in silver, artistically engraved, including penholders, pencils and hair ornaments, &c.

ST. BENEDICTS' INSTITUTE.

Although not received we may state the fact that St. Benedict's is sending drawings—thirty in number—all representative of local life, the handwork of pupils of the Institution. There are representations in oils, water colours, pen-and-ink etchings, drawings of Sinhalese architecture, maps, etc. A striking bit of work is a picture three feet by two feet—a map of the Island, surrounded with drawings (from photographs) of the busts of all the Governors of Ceylon from the earliest to Sir Arthur Havelock. On the top is the British Court of Arms. At the bottom appears a view of Colombo Harbour. Another drawing is a map of the Island surrounded with water-colour paintings. The paintings represent many subjects: A Sinhalese chief and his wife; the Moorish moonstone cutter; the other subjects are a Mudaliyar and his wife; An appuhami and his wife; a Ceylon chetty and his wife; a Bombay merchant; a Sinhalese Buddhist Priest; a Veddah;

a Parsee; a Malay; a Devil Dancer; a Jaffna Tamil; and a Parawa. The paintings in oils consist of a Tamil woman; a Sinhalese Mudaliyar; a Sinhalese black-smith; a Veddah; a Sinhalese farmer; a Sinhalese mountaineer (an octogenarian). Included among the oil paintings are representations of estate scenery and mountain scenery. In water colours there are king-coconuts; Green coconuts; the Vanilla plant; a bunch of *lovi-lovi*; nutmegs; a Kandyan headman; and Ceylon frogs.

Many more things might be particularised, but we have, we trust, already shown the comprehensive character of the exhibits in the Ceylon Courts, of which only a small portion have been as yet received at the Agricultural School. The task the Committee has to face is to avoid sending duplicates. From almost every Kachcheri specimens of Ceylon industries have to be received and the work of selection will not be an easy one.

A NEW CEYLON COMPANY: UKUWELA (TEA) ESTATES.

This new Company, has for its directors, Messrs. F. G. Ambrose, of Ukuwela. H. L. Anley, of Mahatenne, W. B. Anley, and J. B. Anley. The solicitors are, in London, Messrs. Harward and Stephenson, of Lombard St., and Messrs. F. J. and R. F. de Saram, of Colombo; the National Bank of India being the bankers. Mr. T. W. Palmer, of 165, Fenchurch St., is the Secretary (*pro tem.*) The prospectus runs:—

Share Capital divided into 378 Six per cent. Preference Shares of £25 each	£9,450	
302 Ordinary Shares of £25 each ...	7,550	
		£17,000
Debenture Capital 270 Five per cent. First Mortgage Debentures of £50 each		13,500
		£30,500

PROSPECTUS.

This Company is formed to acquire, carry on, work, and develop the Ukuwela and Bowatte Tea Estates, in the District of Matale West, Ceylon, and to purchase other suitable properties as favourable opportunities may occur. Ukuwela is situate within 200 yards from the Ukuwela Railway Station, and Bowatte adjoins Ukuwela on the West. The Estate comprise about 558 acres, of which 313 acres are Tea in full bearing, 47 acres tea rising two years, 13 acres tea rising one year, 13 acres tea planted this year, 82 acres cocoa just coming into bearing, rising four years, six acres grass land, 84 acres reserve land, total 558 acres.

The yields for the seasons, 1st January, 1895, to 31st December, 1897, averaged 914 lb. manufactured tea per acre over all the 300 acres which were then in full bearing, and realised a net average of over 35½ cents. per lb., whilst the cost of production delivered at Ukuwela Station was under 16 cents. per lb. The yield of the 300 acres in 1896 was 1,037 lb. manufactured tea per acre. The estimate for the 313 acres now in full bearing for the year ending 30th June next, is 280,000 lb. of manufactured tea, and as 207,500 lb. were secured up to end of March last, the estimate may be considered quite safe. Future yields should be considerably increased by the crop on the 73 acres of young tea which is gradually coming into bearing. Cocoa and other credits should realize R2,500. Placing therefore the cost of production of the 280,000 lb. manufactured tea at 18½ cents. per lb. delivered F.O.B., and taking the net average price at 31 cents. per lb., the profit should be as follows:—

Tea, 280,000 lb. at 12½ cents. ...	R35,000·00
Cocoa and other credits ...	2,500·00
	R37 500·00

This, at the exchange of 1/4 per rupee, equals £2,500, which should, after paying the Debenture interest and Preference Dividends as well as the London expenses, leave a surplus sufficient to pay about 10 per cent. on the ordinary shares.

The Estates are in a good state of cultivation and are well equipped with a modern factory and machinery, three substantial bungalows, other buildings, and permanent Coolie lines.

The price to be paid by the Company for the purchase of the Estates, free from incumbrances, is £30,200 payable as to £11,500 in cash, as to £7,450 by the allotment of the 298 six per cent. Preference Shares, as to £3,050 by the allotment of 122 Ordinary Shares, and as to £8,200 by the allotment of 164 Debentures.

The only contract entered into is one, dated 4th May, 1899, between Frederick George Ambrose and this Company, being the contract for the acquisition by the Company of the above-mentioned properties. Nothing has been or will be paid in respect of promotion or underwriting.

THE DOOMOO TEA COMPANY OF CEYLON, LTD.

ANNUAL MEETING.

THE REPORT

of the directors was submitted by the chairman as follows:—

The Directors have the pleasure to submit their Report and Accounts for the season ending 30th June, 1899.

The quantity of Tea received from the two Estates was 196,585 lb. out of an estimated crop of 220,000 lb., against 205,902 lb. last year, and the price realized was cents 42·83 per lb. against cents 43·13 last year.

The expenditure on Verellapatna includes the upkeep of 120 acres young Tea which only yielded 80 lb. an acre.

After writing off R2,500 to Depreciation Account and R2,500 to Reserve Account there remains available a sum of R24,787 52 which your Directors recommend being disposed of as follows:—

That a dividend of 6% for the year be paid on the Capital of the Company, absorbing R24,000, and that a balance of R787·52 be carried forward.

The estimate for the current season is 220,000 lb. Tea on an expenditure of R72,440. which includes a sum of R5,700 for the removal and re-erection of the Doomoo Factory for use as a withering shed on Verellapatna.

The acreage of the two Estates now stands as follows:—

Doomoo ...	210	acres Tea 5 years old and upwards.
	3	" " 3 " "
	28	" Timber.
	58	" Grass land.
	299	acres.
Verellapatna	310	acres Tea 5 years old and upwards.
	35	" " 4 " "
	120	" " 3 " "
	35	" " 2 " "
	24	" Under 2 years.
	10	" Grass land.
	154	" Waste and Patana.
	688	acres.

During the year Mr. H. G. Bois having left the Island Mr. F. W. Bois was elected to the vacant seat on the Board.

In accordance with the Articles of Association Mr. W. B. Kingsbury retires from the Board, but being eligible offers himself for re-election.

TO ALL PARTS OF ASIA, AFRICA, AMERICA AND OCEANIA.

Seeds & Plants of Commercial Products.

Castilloa Elastica Cervantes.—Orders being booked for the coming crop of seeds available in March and April, selected seed from very old trees. R. N. Lyne, Esq., Director of Agriculture, Zanzibar, writes under date 24th August, 1899:—"Please send me 200 seeds of Castilloa Elastica for further trial; the seeds of Castilloa you sent me last August germinated very well." Price and particulars in our Circular No. 32; special quotations for large orders according to quantity; immediate booking necessary to avoid disappointment.

Hybridised Maragogipe Coffee.—A larged-beaned superior variety of Coffee in demand; orders booked for the coming crop of seeds, February and March delivery. Price according to quantity on application.

Hevea Brasiliensis (Para Rubber).—Orders being booked for the coming crop available in August and September, 1900. This is the only crop of seeds in the year. All orders should reach us before the end of July to avoid disappointment, as we have to make arrangements in time; guaranteed to arrive in good order at destination. We have already booked a large number of orders. A Sumatra Planter writes, dating 9th March, 1899:—"I consent to the price of £——per thousand. I herewith order 50,000 upon condition that you guarantee at least 33 % seeds germinating." Plants can be forwarded all the year round in Wardian cases. Price and particulars as per our Circular No. 30. A Borneo planter writes dating, Sandakan, 17th August, 1899:—"The last lot of Para seeds turned out very well."

Ficus Elastica (Assam and Java Rubber.)—Seeds supplied by the pound with instructions; price according to quantity. This tree grows equally well in high and low land, in forest and grass land, its cultivation being extended largely by the Indian Government. For price of seeds with particulars as per our Circular No. 33.

Manihot Glaziovii (Ceara or Manicoba Rubber).—Fresh seeds available all the year round; price as per our Circular No. 31. It is superior to Mangabeira rubber and second to Para rubber.

Urceola Esculenta (Burma Rubber) and **Landolphia Kirkii** (Mozambique Rubber).—Seeds and plants, both are creepers.

Cinchona Seeds.—Different varieties.

Sterculia Acuminata.—(Kolanut). Superior quality, seeds and plants; price on application, packed to stand the transit well for several months, a hardy tree, cultivation easy.

Erythrina Lithosperma.—Thornless variety, new crops of seeds ready in December, May and June. Price according to quantity on application.

Seeds and Plants of Cinnamon, Nutmeg, Clove, Sandlewood, Pepper, Cardamom, Vanilla, Arabian, Liberian and Maragogipe Coffee, Cacao, Tea, Coca, Fibre, Medicinal and Fruit Trees, Shade and Timber Trees, Eucalyptus various varieties, also Palms, Bulbs, Orchids, &c.

Our enlarged Descriptive Price List of Tropical Seeds and Plants of Commercial Products for Foreign Countries for 1899-1900 are now being forwarded to applicants in different parts of the world. Also Descriptive Price Lists of Seeds and Plants of Fruit Trees, Bulbs, Tubers and Yams, and Orchids.

"South Africa."—The great authority on South African affairs of 25th March, 1899, says:—"An interesting Catalogue reaches us from the East. It is issued by William Brothers, Tropical Seed Merchants, of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to William Brothers."

A leading Planter writes from *New Hebrides* under date 17th January, 1899:—"I shall like a few more of your Catalogues to distribute through these Islands, as I feel sure many would place themselves in communication with you, did they know where to write for Seeds and Plants."

Our New Descriptive Price Lists of Seeds of Shade Trees for Coffee, Cacao, Tea, Cardamoms, &c., Timber Trees, Trees for Avenues, Hedges Wind and Shelter Belts, Ornamental Trees, Shrubs and Climbing Plants; and Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons and Dracinas, now being prepared and will be ready shortly.

Agents in London:—Messrs. P. W. WOOLLEY & Co., 33, Basinghall Street.

Agent in Colombo, Ceylon:—E. B. CREASY, Esq.

Telegraphic Address:
William, Veyangoda, Ceylon.
Lieber's, A.I. and A.B.C. Codes used.

J. P. WILLIAM & BROTHERS,
Tropical Seed Merchants,
Henaratgoda, Ceylon.

THE DARJILING TEA CROP.

RESULTS OF THE DISASTER.

There has been, we cannot but think, some misapprehension about the effects of the cyclone which recently swept over the Darjiling district, as regards the damage done to tea estates and the probable results on the Darjiling crop for the year. A tea garden in the hills is planted, as a rule, on a series of small spurs, that is, on the side of a hill which is divided up into separate sloping strips by a number of *jhoras* or ravines. Flats—even what are called flats in the hills—are rare and of small area, and are usually narrow strips along the banks of the main streams, flowing at a moderate gradient at the bottom of the big valleys; these narrow strips being cut up into small sections by the minor *jhoras* or ravines joining the main stream. In any very heavy rain there is always the danger of bits along the edges of the *jhoras* being cut away by a big rush of water, or of being undermined and falling in; but there is very little possibility of the main surface of the spurs being carried away. We may therefore take it for granted that no one slip of any really large area is at all probable.

That there may have been a great number of small slips is of course probable, but we do not think that the aggregate area of these is likely to be sufficient to seriously affect the outturn for the balance of the season. Of Messrs. Finlay Muir and Co. gardens, it is stated, Moondakoti lost three houses, the people lost their belongings, but no lives were lost, and evidently no tea. Dhajia was "scarred with landslips from end to end,"—evidently slips in the *jhoras*; but "the tea, however, had not suffered." Phuguri reports considerable damage to buildings and forests, stable and tea house unroofed, factory and bungalow badly shaken (by the way—which is the tea house and which is the factory? reporters on the dailies are not very well up in *technique*;) roads were blocked and "about an acre of tea was damaged, but was being repaired." This latter remark was a touch of genius. We have no doubt many of our readers would very much like to know how damaged tea is repaired, and that a good deal more than an acre would be found, on most gardens, sadly in need of the "repairers" skill, without the excuse of a cyclone. Who does the tea repairs on a damaged garden?

Darjiling gardens as a rule stop plucking early, and the bulk of the crop had been made before the storm. Estimating that perhaps 15 to 20 per cent of the total outturn for the year was still to come, the couple of hundred acres of tea lost or "damaged" (assuming the figures quoted above stand good), will not effect the amount still to come down to Calcutta to any really appreciable extent, and there will probably not be the boom in Darjiling prices, that some seemed to anticipate.—*The Planter*, Oct. 7.

COFFEE IN JAVA.

Mr. Frank Adam writing to us from "Glen Nevis" Estate, Banjoewangie, Java, under date, 22nd Sept. 1899. Says:—I enclose herewith the two tables of coffee statistics, which I have compiled from reliable Dutch sources, See page 331. Perhaps you may like to have them for the *Tropical Agriculturist.*

Prospects in Java for next years' coffee-crop, are exceedingly good. We are having excellent weather for the blossom, which, this year, has been very early. Already on the three estates, which are under my directorship ("Glen Nevis," "Glen Fallock" and "Glen Luss") a nice amount of blossom has opened and set, and there is still a lot of bud to open, I am hopefully looking forward to crop, over the three estates, of somewhere about 11 piculs per bouw equal to about eight cwts. per acre.

ALL ABOUT RUBBER.

BY J. FERGUSON.

About twenty years ago, when King Coffee was in his last dying struggles, and the Ceylon planters were turning their attention to other economic plants, in the hope of staving off the ruin which was staring them in the face, I, like many others, began to make enquiries about the cultivation of the rubber tree, only to find that the sum total of the information to be gathered, from all sources, was absolutely nothing. If, at that time, such a book had existed as the one I have just laid down,—"All About Rubber, by J. Ferguson,"—I am sure that many a disconsolate coffee planter would have rushed into rubber, and by this time, I doubt not, would have been a prosperous grower of caoutchouc trees. Had I not this work, with all its facts and figures, before me, I would have been disinclined to believe that so much knowledge of this subject existed, when I recall the state of ignorance we all laboured under, only a short twenty years ago. From a book of 340 pages of closely printed matter one naturally expects to be able to extract a considerable amount of information, but I am surprised at the extraordinary results of Mr. Ferguson's research, and can only congratulate the rubber planters of the present day in having such a source of knowledge to turn to, as this book is. We are not only told of the planting experiences of rubber in Ceylon, but in many other countries, and, in addition, about experiments carried on in Trinidad and the exploiting of the industry in the French Soudan. Indeed, no country that has been blessed with an indigenous growth of caoutchouc, or has imported and acclimatized the tree, is omitted from the long list laid before the reader of this valuable work. I know of nothing, the demand for which is more likely to increase as time goes on, than Indian rubber. What with cycle and carriage tyres, horse shoes, diggers' boots and macintosh coats, the quantity required annually must be enormous, and there is every probability of many other uses, to which rubber can be applied, coming into existence. Therefore I am inclined to believe that no planting industry shadows forth a better prospect than that of rubber-growing, and no book can compare with "All About Rubber" in usefulness to the planter who intends, or has already commenced, to cultivate the caoutchouc tree.

COSMOPOLITE.

OPIUM-EATING IN ENGLAND.—A warning note, as to the extent to which the practice of opium-eating prevails in the provinces (as well as London), is sounded by one of our readers. He writes:—"I believe that in the Fen districts of Hunts and Cambridgeshire opium is consumed to a large extent by the working classes, and is purchased by them from the local chemists, as I am informed, in 'pieces as large as your two fingers,' and made into pills by themselves. I know an old washerwoman of eighty who constantly takes it, and not unfrequently is found falling asleep over her wash-tub of an afternoon as a result. I believe that if inquiries were made in villages bordering on the Fen district it would be found that quite a trade is done by chemists in the drug.—*Daily Chronicle*, Sept. 23.

BUYO, OR BETEL-NUT IN THE PHILIPPINES.

HOW IT IS CULTIVATED.

This plant is cultivated with much care in every province, as its leaf, when coated with lime made from oyster shells and folded up, is used to coil around the areca-nut, the whole forming the Buyo (betel), which the natives of these Islands as well as British India, are in the habit of chewing. A native can go a great number of hours without food if he has his betel; it is said to be stomachical. After many years of habit in chewing this nut and leaf it becomes almost a necessity, as is with the case with opium, and its use, cannot with safety, be suddenly abandoned. To the newly-arrived European, it is very displeasing to have to converse with a native betel-eater, whose teeth and lips appear to be smeared with blood. The "buyo" plant is set out on raised beds and trained (like hops) straight up on sticks, on which it grows to the height of about six feet. The leaf is of bright green colour, and only slightly pointed. In all market places, including those of Manila, there is a great sale of this leaf, which is brought in fresh every day. —*Manila Times*, Oct. 4.

COFFEE IN JAVA.

PRICES SINCE 1827.

Table shewing Highest and Lowest Prices, respectively in each year, from 1827 to 1899 (to date) for "good ordinary" Java Government Coffee, (ordinary "East India" or dry preparation) at the Government auctions, held at Amsterdam. Prices quoted are in guilder cents, per half Kilo.

Year.	Prices. Highest.	Prices. Lowest.	Year.	Prices. Highest.	Prices. Lowest.	Year.	Prices. Highest.	Prices. Lowest.
1827	34	26½	1852	27½	24	1877	58½	50
1828	26½	21½	1853	33	26½	1878	54	40
1829	27½	23	1854	33½	28½	1879	50½	40
1830	23½	21	1855	34	29	1880	48	37
1831	34	23½	1856	33½	31½	1881	38½	33½
1832	41	32½	1857	43½	33	1882	36	25½
1833	40	34½	1858	34	27½	1883	35½	27½
1834	38½	26½	1859	38½	29½	1884	36	26½
1835	39	30	1860	40	38½	1885	28	24
1836	36	29½	1861	45	37½	1886	41½	26
1837	31	24	1862	46	44	1887	59	39½
1838	31½	26½	1863	46½	44	1888	51	35
1839	34	30½	1864	46½	40½	1889	54½	44
1840	32	25½	1865	45½	43½	1890	59½	52¾
1841	28	25½	1866	45	38	1891	61½	48
1842	25½	23	1867	42	38½	1892	56	51
1843	23	20	1868	33	30	1893	56½	50
1844	22½	20	1869	43	32½	1894	53½	51
1845	23½	21½	1870	35½	31½	1895	56½	51
1846	22	19½	1871	43	32½	1896	54	50
1847	21½	20	1872	50	40½	1897	51	36
1848	20	17	1873	65½	50	1898	38	33
1849	34	18	1874	72½	50	1899	33	25¾
1850	37½	24½	1875	61	52			
1851	30½	23½	1876	57	50½			

[A guilder is equivalent to 1s 9d or R1·30 in Ceylon at current exchange; and a Kilo is equal to 2·2046 lb. avoir., half of which is 1·1023 lb.]

Table of Prices &c., during 1880 to 1899 (to date) inclusive.

Years.	Prices in francs, per 50 kilos, of Santos Coffee, in Havre. Highest.	Lowest.	Brazil Crop in Bales.	Supplies in Europe & America in Tons.	Deliveries in Europe & America in Tons.
1880			3,983,000	547,050	522,940
1881			5,750,000	599,420	563,890
1882			5,650,000	603,308	599,008
1883			6,700,000	683,083	638,057
1884			5,050,000	610,965	616,443
1885	54	45½	6,278,000	657,234	655,092
1886	76	46	5,531,000	593,469	672,783
1887	117	91½	6,129,000	535,692	540,332
1888	102	69	3,006,000	568,858	608,523
1889	105	87	6,733,000	604,000	598,558
1890	112½	103	4,198,000	570,661	595,745
1891	107	80½	5,308,000	610,950	621,786
1892	102	82	7,397,000	699,907	669,321
1893	106	86	6,316,000	646,349	650,337
1894	103½	87	4,325,000	644,650	649,872
1895	97	89½	6,704,000	701,707	661,201
1896	92	58½	5,489,000	703,540	703,512
1897	62	36	8,694,000	882,342	786,882
1898	41	35	10,461,000	897,044	842,694
1899	38½	34	8,772,000	—	—

FRANK ADAM.

"Glen Nevis," Banjoevangie.
22nd September, 1899

THE PARIS EXHIBITION.

THE INDIAN TEA ROOM.

Calcutta, Oct. 11.—The Lieutenant-Governor of Bengal has sanctioned a grant of £500 sterling, and the Chief Commissioner of Assam R10,000, towards the expenses to be incurred in connection with the exhibition of Indian tea at the Paris Exhibition. A grant equal to £4,000 sterling has also been made by the Government of India. The Committee of the Indian Tea Association in London was desirous of raising £10,000, but it is understood that it will be able to make a fairly adequate representation of Indian tea for £6,600. Of this sum the Imperial and Local Governments have given the largest share, leaving only a balance of £1,433 to be subscribed from the American Market Fund. This latter Fund has now reached R98,000, and it is hoped that the amount (namely R1,20,000) contributed last year will again be raised.—*Madras Mail.*

Agricultural Experiments continue to be conducted at the Dumraon farms, under the supervision of the Department of Agriculture. The results obtained there show that ashes of cowdung make the best manure for paddy, and cowdung itself for wheat, although apparently only on irrigated land. The experimental cultivation of varieties of paddy, wheat, potatoes, cotton, maize, and bajra was tried in the Dumraon farm during 1888-89. The results obtained showed that the bansmati variety of paddy gave the best yield.—*Friend of India*, Sept. 21.

RUBBER PRODUCTION IN THE AMAZON.

The principal rubber-bearing areas in the State of Para are the islands of the River Amazon near the city, the principal, Marago, having an area of 2,500 square miles; the banks of the river Tocantins; the banks of the rivers Zingu, Jary, and Tapajos. The upper and lower districts of the Amazon produce the same kind of rubber, but that coming from the upper river obtains a slightly higher price, heing dryer by the time it reaches the port of shipment. The collecting season for rubber in the Lower Amazon begins when the waters have subsided—about July—and ends in January or February. Collecting is not undertaken, as a rule, in the wet season, because the quantity of water that accumulates in the forest impedes the movements of the Collectors, and the rain water that runs on the trunks of trees prevents the clay cups from adhering to the bark. The sap is also weaker in this season. The United States Consul at Para, in a recent report, says that the collectors employed are principally Brazilians, immigrants from the States bordering on Para, such as Ceara, Maravham, and Piauhy, also Portuguese and half-castes. The pure South American Indian is of very little use as a labourer. He has but few wants, lives by fishing and hunting, and is less dependent on labour than more civilised people. There are many thousands of collectors in the rubber field, yet the number does not supply the demand.

The last few years have shown a steady and rapid increase in the exports of rubber, and while labour has also gradually increased, it has failed to keep pace with the fast-growing demand, Among other articles used in the india-rubber industry is a clay funnel, in shape very much like an ordinary toilet water-jug without a bottom or handle. It is made of the clay that is found in most parts of the Amazon region. The fuel used in the funnel consists generally of the nuts of the following palms:—Native name—"Urucuri," "Tucuma," "Inaga;" botanical name—*Attalea*, *Astrocaryum*, and *Maximiliana regia*. It was at one time imagined that the excellence of Para rubber was greatly due to the kind of fuel used in curing it. The palms that furnish the fuel were accordingly transplanted to Africa, with a view to the production of Para rubber there. The experiment, however, has not met with success. The reason these nuts are selected in Brazil is because they emit a continuous dense smoke, and are more portable than other fuel obtainable. However, when none of the palms named are accessible, bark and twigs are used as fuel.

Every one engaged in the forest carries a knife. One of its uses is to cut down fuel for the preparation of rubber. The blade is about 26 inches long, and about 2 inches broad. Owing to the damp climate, the blades are electro-plated, thus preventing their becoming rusty before they are marked. The handles are made of wood, and are carved or inlaid with brass. The rubber collector's axe is a very small affair. It is required to chip a smooth surface on the bark preparatory to attaching a cup to the tree. The handling of the axe requires great skill, in order not to injure the bark. A smooth surface is made in order to prevent impurities from mixing with the sap. The cups are of clay or tin. The former are attached to the bark by means of a little clay. Their weight, however makes them inconvenient to carry when the trees to be tapped are separated by long intervals; the collector then prefers to carry tin cups, which are much lighter than the others. They easily penetrate into the bark by means of their sharp edges, and hold to the tree without the use of clay. The use of the tin cup, however, is to some extent injurious to the tree.

Part of the collector's outfit consists of a light gourd, large enough to carry the contents of from 500 to 700 cups. A clay bowl is next required in order to receive the contents of the gourd. It is of sufficient size to contain the product of several days' work before it is cured. The calabash tree provided calabashes which are employed to ladle the milk from the clay bowl into the mould. A broad-bladed wooden paddle is used as a mould, and is made locally. This completes the outfit for the rubber collector. All these articles are made locally, with the exception of the knives. The axes and the tin cups are manufactured in the towns and villages of the Amazon region. The collector has to use his knife to cut his way through the undergrowth, and also to cut down a sapling occasionally to bridge a rivulet. At times he is knee-deep in ooze or up to his waist in water. On arrival at a rubber tree, he chips away the rough parts of the bark, makes a more or less smooth surface, attaches a cup and makes a small gash above for the sap to fall into the cup, and repeats this process in a line round the tree untill he has attached six or seven cups. Then he proceeds to the next tree and does the same. He continues this process until he has tapped from 75 to 150 trees, which can be done in a day, if they are not too far apart. On the following days the gashes in the trees are made a trifle lower down than the first ones. Some collectors tap the trees in the morning, and return to collect the sap in the evening, whereas others tap in the evening, and collect in the morning. An expert gathers 7 pounds daily in the Lower Amazon; in the Upper Amazon three times this amount is collected. When the accumulated rubber is sufficient—usually in three or four days—a collector lights a fire in the hut he has erected, places the funnel over the fire, pours a thin coat of milk over the paddle, and holds it over the smoke to coagulate. The process is repeated until a large cake has been formed. To release the paddle from the cake it is necessary to make a slit on one side. The paddle mould makes a cake of uniform and even shape, and is in general use in the State of Para. In other parts, a spit is placed on two upright forked sticks, and given a rotary motion. By this means, the rubber is cured with greater ease. Paddle-smoked rubber is decidedly preferred, as it is dried and seemingly more carefully cured.

Many attempts have been made to introduce improved curing apparatus. Up to the present, however, the efforts have not been successful, because the common method, although very primitive, possesses the advantage of being simple and inexpensive. The process of curing rubber is found to be very injurious to the eyes. Many cases of total blindness result from it. There are three grades of Para rubber, viz., fine, medium, and coarse. If rubber is not uniform, and contains impurities, it is classified as medium. The coarse quality, or "Sernamby," consists of scraps that have not been cured. Insufficient labour is the most serious difficulty in the rubber industry. Consul Kenneday says that it would scarcely seem advisable to invest money in rubber estates unless the owner can first see his way clear to obtain sufficient labour with which to collect the rubber.—*Journal of the Society of Arts*, Sept. 22nd.

THE BURMA RUBY MINES, which have had such a bad time of it are now beginning to show signs of improvement. A dividend of five per cent is for the first time to be paid. Representations having been made to the Government the arrears —R4,00,000—have been wiped out, and, in addition; there has been a remission of R2,00,000 made in the rent for the two years ending October last. Since the account were closed, it is stated that there is for the five months a mining profit of £11,470, as compared with a loss of £360 for the corresponding period last year. The present dividend might have been greater, but for the fact that the richest mine possessed by the company was flooded for four months last year.—*Globe*, Sept. 16.

GUTTA AND RUBBER IN BRITISH NORTH BORNEO.

By Henry Walker, Commissioner of Lands.

Borneo Guttas and Rubbers are quoted in the price currents of the world and are well known to trade. They have been collected and are still being collected by Dyaks in the vast jungles of British North Borneo. There are many qualities of gutta, the price of which varies from $30 to $380 a picul, say 5½d. to 5s. 9d. a lb. Of Rubbers there are several kinds but the price is more constant, say about $60 to $80 a picul or 10d. to 1s. 2d. a lb. The railway to the interior, now constructed as far as Beaufort on the Padas river, promises to increase the export of gutta from the West Coast of British North Borneo as parties of Dyaks are already making their way up to the interior by the route in larger numbers than hitherto. In 1895, one Dyake Chief, Nakoda Balli, came down the Penotal George road with some Murnts from the far interior of North Borneo and sold his collection of gutta for $3,600 (that was the first time that any of the interior tribesmen had seen the sea), but the collections likely to be made by Dyaks in the near future will probably beat that record. The Dyak collector only fells gutta trees over six inches in diameter, because, as he says, trees of a smaller size have too thin a bark to yield any gutta. Consequently the gutta collector does not exterminate—he merely collects a ripe crop and leaves nature to furnish a further supply in years to come. In this respect he differs from the gutta leaf collector who fells every tree, small or great; and if leaf collecting is allowed, extermination must ensue—or so few trees will be overlooked that future collection will not pay. Another point against leaf collection is the weight of the leaf, if not dry—the trouble of drying it—and when dry the small percentage of gutta extracted.

Having felled a gutta tree, the collector rings the trunk at intervals of about seventeen inches—cutting through the bark to the wood—and, if available, places a piece of bamboo below each cut to receive the juice and keep it clean. A great deal of the variation in price is due to bad treatment and to adulteration with leaves, twigs and soil. There are many trees in British North Borneo yielding gutta, but I am not yet able to give any but native names. At Tenom at the junction of the Pagalan and Padas rivers, which is to be the terminus of the present railway, a fair is now held every fifty days and is attended by traders who carry up salt, cloth, matches and luxuries, such as Rimmel's scents in superior bottles, l and bring down gutta, rubber, dammer, rattans, bees-wax, skins, &c. At Tenom there are seven kinds of gutta with the following native names:—

Ilang, two kinds, red and white, price $100 a picul. At Kaningow thirty miles higher up the Pagalan; this is better prepared and fetches $120.

Gutta Durian, red, $100. Gutta Tagal, $80. Bajoorye, $80. Merrisa, $60. Menown, $30 to $40.

Of rubber two kinds are brought to the fair:—Kubal at $60 and Menungunor Gutta Lichakat $80.

The Menungun rubber creeper is cultivated by the natives dwelling on the Telicossan river, a very large stream—so large indeed that at times it causes a flood on the Padas. There are several large villages with long houses well raised above the ground containing sixty doors, *i.e.*, families. Some of the people have plots planted with the Menungun creeper which they tap after about the seventh year and only retap when the last wound has healed, which probably means once a year. I am told that this creeper attains a diameter of twenty inches. I have seen it fully six inches thick on the Segama River and it is known all through North Borneo by the same name. The fruit resembles a very large orange and is sweetly acid—a most delicious fruit to eat. So far as I know it ripens in October. It should be grown together with rotan, which assists the creeper in climbing upwards.

All the above guttas and rubbers grow in the Tenom district where the Government is now opening an experimental garden under the charge of Mr. Chas. Keasberry. That gentleman informs me that he can get all the labour he requires and frequently has to refuse work to parties of natives from the Upper Padas. A large block of Tobacco land was marked out on the upper Padas by the Borneo Tobacco Syndicate and since then the natives are constantly enquiring when the estate will be opened. From what I can gather I should say that several thousand coolies can be obtained from the Upper Padas when required for planting purposes. The women work as well as the men. Until the railway is opened to Tenom the bridle path on the right bank of the Padas must be availed of. When I used the road in July it was in good order and I could have ridden a pony along it except for one small landslip at Royoh and one fallen tree. Mr. Tower, the Railway Engineer, who was with me, remarked that it was as good a bridle path as the hill roads of Ceylon. The telegraph wire runs along this path which can be kept in order by the telegraph coolies at a small additional expenditure.

At present a party of Dyaks are seeking gutta on the lower Padas district which contains gutta trees in large quantities:—a very reassuring fact to the planter who may think of taking up land along the railway line. An application has just been made by the Eastern Extension Telegraph Co. for a huge block of land between Bukow and Beaufort, along the railway line, for rubber and gutta planting.

At Kaningow on the Pagalan the great southern tributary on the Padas, a better class of gutta is brought called Kayan, a red Gutta, which sells for $200 at Kimanis. It is of a superior quality, unbreakable when bent and comes from Menown on the south-east of Kaningow in the Daht country. This wealth of natural, indigenous, gutta extends across the territory to Sandakan, but at Sandakan a more valuable class of gutta is obtainable. The local name is Klapeii, a large and a small leaf, red underneath, growing on low hills the gutta from which sells for $140 to $380 a picul, say (at exchange 2/-) equal to 2/1 to 5/9 per lb.

I met parties of Dyaks on the Segama in 1885, who had been about 250 miles up that river gutta collecting, but the Kinabatangan and its great tributaries, which extend beyond the centre of our territory up to the Eastern slopes of the West Coast hills, afford the largest gutta collecting ground. The amounts collected must vary considerably, but as far as I can learn the gutta collectors earn about nine or ten dollars a month after paying their expenses. Their expenses are not great; a little rice, a little (a very little) clothing, matches, salt and tobacco, all of which they obtain on credit from a trader, who, of course, expects to buy the gutta on their return. He has to pay the current price and the Dyaks are quite able to take care of themselves in that respect. When in the jungle the Dyaks maintain themselves by fishing, snaring and hunting, in which they are assisted by their dogs. On the whole the gutta collector's life is a hard one—small profit and much loss of life—but their traditions and customs lead them into the jungle where they can indulge their taste for a wild, savage, life to the fullest extent except as regards head hunting which has been put down with so stern a hand by the European and the venture some Dyak now only rarely takes head.

Large collections of gutta are made on the head waters of the Padas by the local natives but these chiefly go to the independent territories and into Dutch Borneo and are sold to traders who supply repeating rifles and guns of sorts, the importation of which is not allowed in British North Borneo.

The exports of Gutta and Rubber from British North Borneo for the years 1897 and 1898 were as follows:—

	1897	1898
Gutta	$93,639	$125.280
India Rubber	$49,513	$ 79,600

—*British North Borneo Herald.*

NOTES FROM BRITISH CENTRAL AFRICA.

Mlangi, B.C.A., 18th Aug., 1899.

What fortunes might be made in

RUBBER

at present prices; but, as a man remarked to me the other day, his fortune would have been secured had his grand-father planted 100 acres of *ficus elastica*. We have the tree here at least a tree which answers the description I have read of it some where, most likely in your *T.A.* I have two enormous trees in my shade clearing and have just been tapping one and a man has just brought in 1 lb. 2 oz. of rubber for one day's work and I am quite sure there is a week's work before the tapping is finished, the rubber is a beautifully white sample. We have

ANOTHER RUBBER TREE

here *Kickxia Africana* which yields rather a sticky rubber that does not coagulate well—*Landolphia Kirki* and *Landolphia Petersiana* are the common vines of the country, but they are few and far between. The only rubber exported from East Africa seems to be the produce of these two vines, the natives don't know how to tap the rubber producing trees besides the above named, we have a very common vine of enormous dimensions, about a foot in diameter is a medium-sized one, in which I find a large quantity of rubber. It simply runs from the vines when cut like blood from a wound, but the natives cannot manage it either: it is so sticky they can do nothing with it. I took a couple of men with buckets and made them tap a vine holding the bucket under the wounds made and in one day the result was 2½ lb. of liquid rubber which I coagulated with acid. I don't know that this rubber vine has been identified, but think it must be the vine that I have read about being tapped in Madagascar.

THE NATIVES HERE

are very destructive in their method of collecting rubber. They cut down the vines, then cut them in handy pieces and slice pieces out of the bark here and there—of course only getting half the rubber they ought to get—and destroying the vines, which take many years to grow up again. Traders don't instruct natives how to tap rubber trees or vines. All they want is to secure the rubber at as cheap a rate as possible, with the result that there will be

NO RUBBER IN AFRICA

in the course of a few years. Government should take action in the matter.

Only the other day I arrested a party of men sent out by a European trader to collect rubber, and thus had any number of vines destroyed on my land, they got fined £3 each or six months hard labour for it. Of course the men did'nt know they were doing wrong, having been sent by a white man, who by the way paid the fine and returned the rubber collected to me, I shall make him pay for the destruction of the vines if possible.

This is a poor man's country.

LAND AND LABOUR ARE CHEAP,

and when we get a railway, perhaps the country will be opened up a bit, progress is slow principally owing to the country having got a bad name for B. W. fever. I don't think it is worse, if so bad, than your tropical typhoid. The Malaria Commissioners begin to think they have come to the wrong place as they cannot get cases.

Don't send any Ceylon men here like that gentleman Stephens, who turned in a funk from Chinde: they are not the stamp of men to pioneer in a country like this. I got a letter from that gentleman which I never answered. I am afraid the stamp of planters you have in Ceylon now-a-days, at least few of them are like the old pioneers of coffee planting who had to suffer many hardships as well as sickness R. B.

DEPARTURE OF AN AMERICAN SCIENTIST.

Dr. Edwin Mead Wilcox, of Harvard University, Cambridge Mass., U.S.A., who has been spendiug a month in Ceylon, in order to gather information with respect to the cultivation of our chief products, left with Mrs. Wilcox last month by the P. and O. "Bengal" for Singapore. There he spends a week before proceedings to Java. Dr. Wilcox writes to us as follows:—"Thanks to many Ceylon planters and the great fund of information they all seem to have. I have secured much of value to me in my work in Cuba." Dr. Wilcox, we may remind our readers, is eventually to take charge of the Sub-Tropical Department of Harvard University that will be opened near Cienfuegos, in the South of Cuba. He will be studying tropical products in Java until May next year.

PLANTING NOTES.

RUBBER TROUBLES IN S. AMERICA.—Complaints are now made in Sao Paulo of the depredations of the mangabeira rubber gatherers. They do not trouble themselves to tap the trees, or shrubs, but they cut them down and even cut the roots. Of course they are rapidly destroying the sources of what might be a permanent and profitable industry.—*Rio News*, Aug. 22.

A JAPANESE GREEN MANURE.—The U. S. A. Experiment station at San-in (Japan) has been cultivating a plant known locally as umakoyashi (*Medicago denticulâta*). This has been selected for experiment because its cultivation and utilization, as a green manure, is considered a matter of special importance locally. Analyses show the plant to contain 0.78 per cent of nitrogen.—*Planting Opinion*, Oct. 14.

CINNAMON FOR INFLUENZA.—A correspondent writes:—"As this drug is being recommended as a remedy for the epidemic influenza, it may be well to caution the public against depending upon the culinary essence known by that name, and sold at low prices. This is made from cassia, a bark which, whilst it is quite destitute of the medical virtues of the genuine article, resembles it so nearly in taste and odour that those requiring the one may receive the other. Those desirous of trying the remedy should obtain it from their chemist, and ask for genuine tincture of cinnamon, or spirit of cinnamon 98, and in no case take essence of cinnamon. Cinnamon is much more expensive than cassia."—*South Australian Register.*

CACAO SOILS IN THE WEST INDIES.

Government Laboratory, Georgetown, Demerara, British Guiana, Aug. 31.

DEAR SIR,—My attention has been directed to an article in your issue of July 18th, 1899, in which Mr. Cochran has ascribed work done in this laboratory by myself and staff to Professor Carmody, of Trinidad. I shall be obliged to you if you will give to Mr. Cochran the two pamphlets I have sent under cover to you, the first entitled "The rocksand soils of Grenada" and "The agricultural chemistry of cacao" and the second an extract from a report on the agricultural work in the Botanic Gardens of this colony relating to cacao. I may remark that the Grenada soils were personally selected by myself from the plantations.

I have also a series of analyses of the very fertile cacao and coffee soils of Surinam, which I made for the purposes of comparison with the soils of the interior of the Colony, which, if they are of any interest to you or to Mr. Cochran, I shall be happy to place at your disposal.

Professor Carmody's analysis are not comparable with ours, as he uses a different method of attacking the soil with acid solvents. We have for the last 15 years used invariably the process described in one of the pamphlets.

I may say that my experience in the West Indies points to the great importance of the amount of potash in an available state present in the soil and to the lesser importance of phosphoric and nitrogen and this consideration is based on the analyses of sixty or seventy different soils.

Thanking you in anticipation for giving the pamphlets to Mr. Cochran.—I remain yours faithfully, J. B. HARRISON.

Government Analyst, British Guiana.

Having handed on the pamphlets, mentioned by Mr. J. B. Harrison, Government Analyst, British Guiana, in his interesting letter which appears above to Mr. Cochran, as requested, the latter has kindly favoured us with the following remarks:—

City Analyst's Office, Colombo, Oct. 21.

I have to thank you for a reading of the letter of Mr. J. B. Harrison, Government Analyst of British Guiana, on the subject of the cacao-soil analyses, with which I dealt in the article you published on 20th July of the present year. I am also much obliged for the two pamphlets he has sent to me, embodying the results of his analytical work of many years.

They represent an amount of original and careful analytical work, which only an analyst can fully appreciate. I should also very much wish to see his analyses of the very fertile cacao and coffee soils of Surinam, which Mr. Harrison offers to place at your disposal.

Of the two sets of cacao-soil-analyses which I compared last July, only the second set, viz., the analyses of soils, of average fertility, was conducted under the supervision of Professor Carmody, Government Analyst of Trinidad; while the first set, the analyses of fertile cacao soils, was the work of Mr. J. B. Harrison, and his staff at British Guiana. I am sorry I did not know that Mr. Harrison was the analyst till I received his letter which you have forwarded. The copy of the proceedings of the Agricultural Society, in which I first saw the analyses (published in 1897) was incomplete, some pages being a-wanting, and amongst them the first page of Mr. Harrison's report; but, even in the complete form which he now sends me, entitled "Extract from the Report on agricultural work in the Botanic Gardens relating to cacao" and printed by authority of the Government, neither Mr. Harrison's name nor that that of any other member of the staff of the Botanical Gardens occurs!

As the two sets of analyses were by different chemists, using different analytical methods, they are of course not so strictly comparable, as if the same analytical methods had been followed, but a comparison is still instructive.

As Mr. Harrison has had great experience in the Analyses of cacao soils, planters will be glad to have the latest word he has to say on the subject which is as follows:—"I may say that my experience in the West Indies points to the great importance of the amount of potash in an available state present in the soil, and to the lesser importance of phosphoric acid and nitrogen, and this consideration is based on the analyses of sixty or seventy different soils."

I find the same view as regards nitrogen more fully expressed in Mr. Harrison's work entitled: "The rocks and soils of Grenada and Carriacow and the agricultural chemistry of cacao*, where he remarks:—"Upon all the soils of Granada, light dressings of nitrate of soda or sulphate of ammonia will prove beneficial to plants and upon the soils which appear in the list marked 'nitrogen' such dressings are in my opinion essential to successful cultivation." (These last are soils in which the amount of nitrogen ranges from ·032 to ·137 per cent.) "Where such crops as cacao, coffee, and nutmegs are the staples, it is necessary to use great care with regard to nitrogenous manures. Heavy dressings of active nitrogenous meanures may easily cause excessive leaf formation, and result in the flowers produced dropping without the fruit setting, and the anticipations of full crops raised by the brilliancy of the heavy foliage, will not to fulfilled. In view of this, I recommend that nitrogenous manures should be supplied to these "crops as a rule in light dressings of not more than one cwt. of Nitrate of soda per acre at the outside, and applied only at the time when the main crops of fruits have just been picked. If the trees show a full leaf development with no signs of flagging, nitrogenous manures should not be applied as their use may result in more harm than good. For cacao, nutmegs and similar crops, I consider that nitrate of soda will probably be found a preferable source of nitrogen to sulphate of ammonia, whilst the latter will be found better for sugarcane."

There are several other very interesting points on Mr. Harrison's able reports, to which I should like to draw attention, if I had the time at present to go into the different subjects discussed; but the object of my present letter is simply to give Mr. Harrison credit for the analysis of the set of fertile cacao soils referred to in my communication published by you in July of the present year.

INDIAN TEA ASSOCIATION.

MEETING OF THE GENERAL COMMITTEE.

The following is an abstract of proceedings of a meeting of the General Committee of the India, Tea Association held on 3rd October, when there were present : Messrs. H. S. Ashton (Chairman), H. C. Begg (Vice-Chairman), W. Brown, R. Magor, G. A. Ormiston, M. R. Quin, A. Tocher, R. R. Toynbee, and T. Traill :—

1. Proceedings of the last meeting of the Committee, held on the 5th September, having been approved in circulation, were confirmed.

2. Proceedings of a meeting of the Darjiling and Duars Sub-Committee, held on the 19th September, were laid on the table.

3. Proceedings of the Assam Branch for the month of August were to be recorded.

4. Minutes of a meeting of the Cachar Branch, held on the 26th August, were to be recorded.

5. Letters of 25th August, and 8th and 15th September from Mr. Ernest Tye, Secretary, Indian Tea Association, London, came up for consideration and disposal after previous circulation. The principal subjects dealt with in these letters were:—

(*a*) Ocean Freights.—Mr. Tye stated in his letter of 15th September that this question had been considered by the London Committee, and that it had been decided to send a copy of the General Committee's letter of 19th July to the Secretary to the Calcutta Steam Conference, with an intimation that the views expressed therein were strongly supported by the Association. It was also stated that a special Sub-Committee had been formed to take charge of the question.

(*b*) Paris Exhibition.—In his letter of 15th September Mr. Tye stated that he had interviewed the Secretary of the Indian and Ceylon Committee of the Royal Commission with reference to the question of tea exhibits. It was suggested at this interview that the samples should be arranged as a trophy and placed in the centre of the Court, or that they might be arranged in cases and exhibited in the tea room. It was considered that about one hundred samples, representative of the various tea districts, would suffice to illustrate the different classes of tea grown. Mr. Tye also stated that he understood the Revenue and Agriculture Department of the Government of India were prepared to receive and forward all exhibits. Special labels numbered and marked for attaching to the exhibits in Calcutta would also be supplied by the Exhibition authorities through the India Office.

The Committee directed the Secretary to communicate with the Secretary to the Government of India in the Revenue and Agriculture Department asking for definite information in regard to the dates by which samples would be required : and also in reference to the special labels mentioned in the London Committee's letter.

The Secretary was also instructed to write to Mr. J Buckingham, C.I.E., Chairman of the Assam Branch, asking his assistance in procuring a collection of dried leaves of the various classes of tea. A collection of this description had been previously asked for by the London Committee as being likely to prove an interesting exhibit.

(*c*.) London Warehouse Charges.—Mr. Tye stated in his letter of 15th September that the Committee in London had under consideration the General Committee's letter of 17th August upon this question. After a full discussion they had decided again to address the Tea Clearing House Committee urging a reconsideration of the request put forward for a reduction of the charges.

As the General Committee's letter No. 561-O of 13th September in which the question was fully dealt with was not before the London Committe at the time Mr. Tye's letter was written, it was now agreed to await their views upon that letter of 11th September from the Acting Secretary, Planters' Association of Ceylon, in reply to hte General Committee's letter No. 463-O., of 17th August, on the question of the abolition of the English import duty; also letter of 14th Sept. from the Honorary Secretary, Dehra-Dun Plantres' Association, and letter No. 1,793 of 2nd Sept. from the Secretary, Darjiling Planters' Association, on the same subject.

In the letter from the Ceylon Planters' Association it was stated that the Committee of that Association were not convinced that the time was ripe for a movement in favour of the abolition or reduction of the duty; or that abolition would be in the best interests of the producers. They were, however, continuing to collect information, and asked upon what figures the General Committee had based their statement: "that it is admitted that reduction of duty in the past has tended to increase consumption as a whole, and that further reduction would have a similar effect."

The Honorary Secretary of the Dehra Dun Planters' Association stated that he would be unable to submit the views of the members of that Association until November, when the next General Meeting would be held. He considered, however, that abolition would enormously stimulate consumption, but it was, he thought, a question whether the effect on production would not mean a very large addition to the area under tea ; an addition probably out of all proportion to the increased demand, and which might eventually place the industry in a worse position than would otherwise have existed.

It was stated in the letter from the Darjiling Planters' Association that that Association cordially supported the action taken by the General Committee.

The Committee regretted the attitude taken up by the Ceylon Planters' Association and directed the Secretary to give when replying the figures upon which the statement referred to was based. The following extract from a speech made by the Chairman of the Ceylon Planters' Association on the 17th February 1899 was also to be quoted viz., "They knew, and they felt undoubtedly, the reduction of duty in past years had tended to increase consumption. Fiugres that were before him were most encouraging. Going back to 1837, when the Queen came to the throne, only 30,000,000 lb. of tea were consumed in the United Kingdom, and the duty was 2s 1d ; in 1897 the duty was 6d, and the consumption was 183,000,000 ; and in 1897, ten years later, the duty was 4d, and the consumption 232,000,000. He did not mean to say that was entirely due to the reduction of duty, because the increase in population had to be taken into account, but it was quite sufficient for his argument that the reduction of duty tended to increase consumption."

The letters from the Dehra-Dun Darjiling Planters' Associations were to be recorded and the further consideration of the question was to stand over pending the receipt of the views of the London Committee, and of the Assam Branch.—*Englishman*, Oct. 12.

THE IMPROVEMENT OF COFFEE.—I.

(*By a Planter.*)

It was recently shown that a comparison of the prices given in the Public Sales List of the bulk of Costa Rica, Mocha, Santos and East India coffees, sold in London in the first half of this year did not support the contention that East India coffee has deteriorated as compared with its rivals. It has, however, been urged that such a conclusion cannot be relied on, as, thought East India may produce a few very fancy sorts, yet brokers are of opinion that the bulk has deteriorated, and is being ousted by Central America coffee of a cheaper and better quality. The reply is obvious. The comparison was made on the prices realised for every class of coffee and not for fancy sorts only. The value of an article is the price it will fetch at public sale, and its comparative value is determined by the ratio of that price to that of its rivals. No amount of private opinion can outweigh the judgment of the public as shown by the price. Further, it was shown that brokers had just the same opinions as to deterioration of East India coffee, and the competition of Central America, in 1885 as now, yet by 1887, when prices had risen, these complanints had ceased. It was allowed that now, as in 1885, the sample may have been poorer than usual; but the point insisted on was that this is no proof of permanent deterioration. In 1885, eight samples of Wynaad A. coffee, selected by a Committee of the Association as representative of the various kinds of coffee grown in the District, sold as follows:—50*s*, ; four samples 56*s*. to 57-6 61*s*. ; 64*s*. to 65*s*. ; 69*s*. 6*d*. These prices are 10*s* ; to 20*s*· below the prices ruling in the first half of this year, but are on about the level of present quotations. The sample which fetched 57*s*. 6*d*. sold in 1886 for 76*s*. to 79*s*. 6*d*. and in 1887 for 96*s*. to 106*s*. 6*d*. The improvement was mainly due to a better market, and possibly in some degree to more favourable seasons, or to greater care in cultivation and curing; but the fact remains that it took place, and there is no reason why a similar improvement should not take place in the course of another two years. As to Central American competition, only this year compilers of coffe statistics have shown that, while the total crops of all other countries have not increased in the last 25 years, Brazil crops have increased 300 per cent. in that time, and over 50 per cent. in the last three years. These compilers have drawn attention to what has been an axiom in the coffee trade for the last 40 years, that it is the size of the Brazil crops which determines the price of all kinds of coffee throughout the world. In view of the fact that steps are being taken to raise Brazilian exchange, while no very, efficacious steps are being taken in Central America, it is most important that we should keep clearly before us, that it is the over-production of Brazil which is the dominant factor in depressing prices. And we may take comfort from the reports in local papers that coffee is unremunerative both in Brazil and Centeral America at present prices in spite of low exchange.

Still, as in 1885 East India planters spared no pains to improve their sample, so now it is no less incumbent on them to do all they can to that end and it is proposed to consider in the light of practical experience the numerous remedies which have been so freely offered. Most of these are suggestions for improving the appearance of the bean by the use of machinery adopted in Centeral America. This consists of improved pulpers, washing machines, drying machines and polishers. Some time ago letters appeared in the *Madras Mail* stating that planters in South India used out-of-date pulpers, and, when these got out of order, the only remedy applied was to set them closer and cut the beans. There may have been instances of such careless, curing, but the remedy is patent. In every planting district there are men capable of pulping coffee with any pulper in vogue for the last 20 years, so that it is not possible on a careful inspection of the wet parchment to find a cut bean. Such men are quite capable, and constantly in the habit, of repairing their pulpers when they get out of order. Hull and Sabonnia diere, in their books on coffee planting mention that Ceylon planters allowed only one-half per cent. for the cut beans. It is, to say the least doubtful, if Centeral American planters can beat this more especially as their pulpers were introduced by manufacturers who had gained their experience in making for Ceylon and Indian planters. The idea that wooden pegs bruise and cut less than copper or brass shows a very feeble conception of the principles of pulping. For one of the best pulpers has sharpened steel edges to catch and remove the pulp and yet will not show a cut or bruised bean. Once it is possible to bruise the bean, a wooden pen will do it as well as any other instrument. The washing machines require puled parchment to be fermented, as in South India, before the mucilage can be removed, and it is difficult to see what advantage washing in a closed box with revoling paddles can have over washing in an open cistern. Still, any one who likes to try it can get a machine from Mesrs. John Gordon and Co. for £18 f. o. b. in London. The peculiar advantage of the Central American system of curing is said, however, to lie in the method of drying parchment in revoling cylinders through which hot air is driven. It is argued on the analogy of tea, the delicate colour of which is destroyed by exposure to the sun, that the colour of coffee is spoilt by this same agency.

A Ceylon planter has recently recomended that coffee, spread very thinly, should only be exposed to the sun for six hours, and then be spread on a reapered floor in the store. If this plan is adopted, it would require enormous storage room, something on the principle of a tea withering house, but on a larger scale, as coffee would take longer to dry than tea to wither. But the principle seems to differ little from that of the experiment, tried in Wynaad and Coorg in 1885-86, of drying on tables over which a pandal of arrowroot leaves, or coir matting, was stretched, at a height of some 5 feet, to keep off the direct rays of the sun. At first, it was thought this drying under shade improved the colour very much; but the Wynaad Committee, after repeated experiments and reference to London experts, arrived at the conclusion that no improvement in colour could be relied on from shade driving, and it was apt to produce a mottled sample, *i.e.*, mixed with faded or fading berries, probably due to uneven drying. It was found that the coffee of several estates so treated which fetched higher prices one year fetched lower the next, and lots dried in the shade and in the sun on the same estate and sold simultaneously, showed no differecnce in price, or a difference in favour of the sun dried. In a couple of years shade-drying was abandoned in both Wynaad and Coorg. The Central American system would of course avoid all danger of uneven drying, and, in view of the extreme importance of improving the sample, it would be well worth trying the experiment. A machine which will dry 500 lb. wet parchment in 24 hours, and can be worked by hand or power, can be obtained from Messrs. John Gordon & Co. for £56 f. o. b. London. This might be used on the estate or the coffee dried as little in the sun on the estate as possible and despatched to the coast for complete drying in the machine. It would be better to have a couple of machines, one on an estate and one on the coast, which would not cost over £130. It should be easy to arrange for any District to defray this cost. But it would not be fair to call on Agents to go to any great expense in this matter, willing as they are to adopt new machines of approved efficacy, until it had been conclusively proved that the Central American system shows a very decided improvement in the appearance of the bean over sun-dried coffee. For we are met, at the outset, with the objection that all East India coffee, some of it fetching the highest price in the world, both this year and for the last 50 years, has been dried

in the sun. Polishers have been long in use on the coast, and are found to improve some coffees, but not others. The effect is said not to be very lasting.

The fact is, the best method of curing coffee, both on the coast and on the estate, is well known in South India. This consists in picking only ripe coffee and pulping it the day it is picked; carefully separating all inferior coffee from the best parchment; fermenting the parchment only as long as is sufficient to remove the mucilage, and washing out in one day all that is pulped in one day; spreading the coffee thinly on the tables, and turning it constantly to ensure even drying; putting it in store before the parchment cracks, and keeping it cool and dry in store by constant turning. The Wynaad Committee found coffee dried to 35 lb. a bushel in the sun gave the best results, but some planters prefer 40 lb., and good results have been obtained from coffee dried much less than this. It should be remembered that the great point to aim at is an even sample. For this purpose, perhaps, more care might be taken than is usually done to float off, not only "empty," but half-formed or imperfect beans. A Ceylon planter recommends that a piece of iron should be fixed in the spout of the pulper so as to separate, not only floaters, but all beans which are not of full weight; and that the latter should be classed as No. II Parchment, and tails and floaters kept separate from that. It is also of importance to pulp as clean as possible, so as to have little tails, and to wash these out daily, and not leave them to be washed up once a week. All but the very best parchment should be kept back, and sold separately at the end of the season, and coffee from "white cherry" should never be mixed with any other. This last sold very badly this year, and would have spoilt any sample with which it was mixed. Lastly, the whole of one despatch should be dried to the same weight, to facilitate the completion of the work on the coast and ensure even drying. If parts of one lot are drier than others, the whole must be kept exposed in the sun till the wettest parts are dry, and the drier may suffer from too long exposure.

A question has been raised as to whether it would not be wise to revert to the old method of packing in cases instead of double bags, as a means of preserving the appearance of the bean. This was also raised in 1885, and experts reported:—"As to packing, we have not hitherto (*i.e.* after an experience of some eight years,) found any disadvantage in double bags as compared with cases, and both have been tried separately and together, while our buyers prefer bags to cases as the bulk of our coffee goes to the Continent. We have no reason to suppose that coffee suffers in bags as we had plenty of good colour in bags." All planters of experience will agree with the Wynaad Committee that no method of estate curing (or coast curing either!) will put colour into coffee, but any great carelessness in curing will rob coffee of such colour as it may possess. This leads to the conclusion that there are many other things necessary to produce a good bean than good curing. But a consideration of these methods must be left for a future occasion.—*Madras Mail.*

A SUBSTITUTE FOR INDIARUBBER.

[TO THE EDITOR OF THE "SPECTATOR."

SIR,—In the *Spectator* of September 23rd you write in reference to the suggestions of Mr. Thornycroft that steam-roller traffic should be encouraged by Mr. Chaplin to carry loads of twelve tons at four miles an hour, that "a substitute ought to be found for indiarubber" as it is so expensive. The late Alfred Nobel invented this substitute, and he invited me to see specimens at his home at San Remo shortly before his unexpected death. He showed me samples of roofing for buildings, for tires of bicycles, for heavy carriages, tubes, rings, and tobacco-holders exactly the same as those which are sold all over England, and which turn inside out. Mr. Nobel asked me to tear his imitation gutterpercha, and also the real articles, which were side by side. I tried and found it impossible to even damage most of the articles he had made, and that even the tobacco-pouches and elastic rings were tougher than the articles made of indiarubber. I was very much astonished. Mr. Nobel said: "Mind, there is no indiarubber in these things. I have flavoured them with it, so that it will be supposed to be real." As a fact, the real and false melt much the same. My late friend said: "There is a larger fortune to be made out of this invention then I and my friends have made out of dynamite. If you have any money invested in guttapercha forests or manufactories get out your money. More certainly than beetroot sugar destroys cane-sugar will my invention gradually kill the guttapercha trade." Mr. Nobel added that "next" year he intended to put up works in Italy and to employ fifteen hundred men to make this substitute, which would be called "Nobel's guttapercha." It would seem as if Mr. Nobel carried his secret to the grave. Because I know nothing whatever about these matters, and my late friend knew, this might have been the reason why he showed me his inventions. I can never forget a thing that Mr. Nobel did that afternoon. He said: "I will show you an invention which I will never reveal because it might do much injury, though sooner or later some one will find out the same secret." He then took some grey stuff out of a tin box, added a few drops out of a small bottle and said: "Now, in one hour's time this towel and this old coat I slightly touch with the mixture will take fire and burn violently. Happy that the *pétroleuses* of the Paris Commune did not know my secret." My late friend put the towel and old coat on an old chair in the garden. I forgot the circumstances during his most interesting conversation, but at the expiration of an hour Mr. Noble said: "It is time; come and look," and within five minutes the coat and the towel blazed up furiously. I am satisfied that Alfred Nobel invented a perfect substitute for indiarubber, which could be produced at half the cost of the real article, and unless his brother knows the secret, it is as unfortunate that the invention is lost for the present as it is fortunate that the Greek-fire mixture will remain unused. As regards Mr. Thornycroft's suggestions, he must remember that to carry, say, sixteen tons dead weight, most country bridges and culverts would have to be inspected yearly, and very many rebuilt. And the number of carriage accidents would become too numerous for newspapers even to note them, in addition to the almost daily cyclists' mortuary list.—I am, Sir, &c., GANDOLFI (Duke).

Blackmore Park, Hanley Castle, Worcester, Sept. 25.

ASBESTOS IN CEYLON.—Some three months ago we reported the local discovery of asbestos, and now we see it mentioned that Messrs. S Peter Soysa and H Francis Fernando, two well-known merchants, have come across the material in one of their plumbago mines in the Galle District. Specimens have been submitted to an analyst who has given it as his opinion that this mineral exists in large quantities in the vicinity of Messrs. Soysa's and Fernando's mines.

THE CONSOLIDATED ESTATES COMPANY, LIMITED.

Our absent Editor writes :—I send you the Report of the Consolidated Estates Co., Ltd. (Messrs. Arbuthnot, Latham & Co., General Managers). It is, I think, a fairly satisfactory document : as one "City" man said to me the other day, "the time for eight per cent. dividends all round is past in Ceylon and a good thing, too, as preventing over-production." I will try and look in at the meeting of the 11th, and hear what is said :—

Authorised Capital £100,000, divided into 5,000 Preferred Shares of £10 each entitled to a Cumulative Preferential Dividend of 8 per cent £50,000, 5,000 Ordinary Shares of £10 each £50,000 Total £100,000.

Eighth annual Report of the General Managers, to be submitted to the Shareholders at the General Meeting, to be held at 34, Great St. Helens, E C, on Wednesday, the 11th October, 1899, at 11·30 a. m.

The General Managers have the pleasure to submit their Eight Annual Report and Balance Sheet, together with Statement of Accounts for the Crop Year ending 30th June, 1899.

The profit and loss account shows a balance (including £70 4s brought forward from last year) of £6,617 6s 6d after paying interest on the debentures, and a interim dividend of 4 per cent. on the preferred shares. Out of this sum the general managers propose to replace the £250 taken from reserve last year, leaving a balance of £5,367 6s 6d, and to appropriate this amount as follows, viz : To pay a balance dividend of 4 per cent. on the preferred shares, making 8 per cent. for the whole year, which will absorb £1,480 ; to pay a dividend of 5 per cent. on the ordinary shares, requiring £1,950 ; * to set aside for redemption of 5 per cent. of the debentures at 103, £2,266 ; carrying forward the balance, viz., £671 6s 6d. The following shows the result of the year's working, viz : Net proceeds of crop—1,368,986 lb tea at an average net price of about 6½d per lb realised £37,242 2s 1d ; cocoa, cardamoms and cinchona bark, £1,167 15s 6d ; surplus on estimated value of produce on hand 1897-98, £86 2s 7d ; interest on account, £138 12s 11d. Expenditure on estates—Messrs. George Steuart and Co.'s drafts —R390,315 at an average of 1s 4 11-32d per rupee, £26,584 11s 3d ; balance of coast advances, £237 11s 11d ; bonus to superintendents—R7,500 at 1s 4 3-16d, £505 17s 2d. The weather during the past season, though somewhat better than that of the preceding year, has not been very favourable for producing leaf ; and consequently the crop shows a slight short fall as compared with the estimates instead of an increase as was hoped when the last annual report was issued. Prices of tea have fluctuated considerably. At one time they showed a material rise, but aterwards fell away and touched the lowest on record, though they have since somewhat recovered with the result on the whole that the tea has realised a net average of 6½d per lb. against 6¼d per lb. last year. The following figures giving the actual results of crop and expenditure as compared with the estimates in the last annual report will be interesting to the shareholders and will serve to show with what accuracy the estimates are prepared under the careful supervision of the company's Ceylon agents, Messrs. George Steuart & Co., viz.: Crop expenditure—estimate R395,659; actual result, R393,803. Crop of tea—estimate 1,392,500 ; actual result, 1,368,986 lb. Capital expenditure—estimate £5,000 (about) ; actual result, £5,112 11s 2d. The estimates for the new season have again been prepared with caution, and are as follows : Wattegodde—expenditure, R101,690 ; crop, 340,000 lb. tea. Hoonoocotua—expenditure, R71,714 ; crop, 240,000 lb. tea. Ellagalla—expenditure, R28,441 ; crop, 92,000 lb. tea. Tallagalla—expenditure, R56,748 ; crop, 230,000 lb. tea. Warriagalla—expenditure, R56,521 ; crop, 180,000 tea. Rutland—expenditure, R49,288 ; crop, 167,000 tea. Sorana—expenditure, R49,374 ; crop, 177,000 lb. tea. Totals — expenditure, R513,776 at 1s 4¼d equals £28,016 1s 8d ; crop, 1,426,000 lb. tea. Also 9,000 lb. cardamoms and 20 cwt. cocoa from Warriagalla and 20,000 lb. cinchona from Rutland. Exchange during the past season has been rather more unfavourable than for the previous year, the cost of the rupee having been 1s 4 11-32nd (for three months' bills) against 1s 4 1-16d in 1897-8. It is no doubt within the knowledge of shareholders that the Indian Government have adopted the recommendation of the Currency Committee and have made gold a legal tender at the exchange of 1s 4d per rupee, so they will no doubt do everything in their power to maintain this rate. No new properties have been acquired since the date of our last annual report, but 49 acres adjoining Sorana and eight acres adjoining Tallagalla have been added to those estates. The cost of the 49 acres of Sorana was provided out of the original purchase money of the estate, and the little plot of eight acres adjoining Tallagalla was paid for out of the factory and extension account.

The usual acreage statement of the Company's Estates is appended, viz :—

The usual Acreage Statement of the Company's Estates is appended, viz :—

Name of Estate.	Ceylon District.	Full Bearing.	Partial Bearing.	Recently Planted.
Wattegodde	Dimbula	800	Nil	25
Hoonoocotua	Kotmale	560	25	15
Tallagalla	Kalutara	397	118	70
Ellagalla	Matale	217	6	8
Rutland	Hewaheta	419	30	70
Warriagalla	Nilambe	406	85	83
Sorona	Kalutara	263	32	205
	Totals	3,062	296	476

Name of Estate.	Ceylon District.	Reserve for Suitable Tea.	Grass Waste, Water, &c.	Total Acreage.
Wattegodde	Dimbula	Nil	70	895
Hoonoocotua	Kotmale	45	117	762
Tallagalla	Kalutara	92	23	700
Ellagalla	Matale	13	201	445
Rutland	Hewaheta	85	59	663
Warriagalla	Nilambe	63	624*	1,261
Sorana	Kalatura	176	94	770
	Totals	474	1,188	5,496

During the current season it is proposed to plant up 174 acres with tea, viz., 52 acres on Tallagalla,

* By the articles of Association it is provided that five per cent of the debentures must be redeemed before any Dividend can be paid on the Ordinary Shares.

* of which 192 acres are planted with Cardamoms and Cocoa.

68 acres on Rutland, 45 acres on Sorana, and nine acres on Ellagalla; also 40 acres with cardamoms, viz., 20 acres each on Warriagalla and Ellagalla. The capital expenditure during the past season for the purposes indicated in the last annual report amounted to £5,112 11s 2d, being a slight excess over the estimate, owing partly to the purchase of the eight acre plot on Tallagalla, and partly to the cost of additional machinery on Sorana to provide for the increased intake of leaf. The greater part of this expenditure, together with the balance at debit of the factory and extension account last year, has been provided for by an issue of £7,000 in 5 per cent. debentures, all of which were sold at par. For next season the capital expenditure is estimated at about £3,000 which includes the cost of opening up the 174 acres tea and 40 acres cardamoms above referred to, as well as some expenditure for machinery, &c., rendered necessary by the expected increase of leaf. Some anxiety is being felt in regard to the blight which has attacked some Ceylon tea properties very severely. Happily very little damage has been done to the Company's estates, and the general managers hope that the preventive and remedial measures which they have authorised will be sufficient to ward off or eradicate the pest. The Company's Ceylon agents have specially recommended a more liberal application of manure to keep the bushes in good heart (as apparently the weakly bushes are chiefly attacked), and this may cause some expenditure in addition to the estimates, though it should also result in some increase of leaf, but the general managers have thought it prudent under the circumstances to carry forward rather a larger balance than usual.

NEW DIMBULA COMPANY, LIMITED.

A general meeting of the members of the above-named Company was to be held at 52, Gracechurch Street, London, on Wednesday the 18th inst., to receive the Liquidator's report showing how the winding up of the Company has been conducted and its property disposed of, to hear any explanation that might be given by the Liquidator, and to pass a resolution as to the disposal of the books, accounts and other documents of the Company.

The resolution to be submitted, was as follows:—

"That the accounts submitted to this meeting shewing the manner in which the winding up of the Company has been conducted and its property disposed of, be and are hereby approved; that the Liquidator be and is hereby discharged from his office and that the books, accounts and other documents of the Company now in possession of the Liqnidator, be handed to the Secretary of the new Company to be destroyed at his discretion after the expiration of one year."

52, Gracechurch Street, London, E.C., 7th October, 1899. A. Crabbe, Liquidator.

The following is the report, for season 1898-99.:—

The Directors have satisfaction in reporting that the re-organisation of the Company was completed in March last, and they now submit the accounts for the financial year ending June 30th, 1899.

The year under review has been exceptional in many ways, exceptional drought was experienced and culminated in a sharp frost on March 7th, which affected a considerable area of the lower fields; the South-west monsoon broke early and was unusually severe, the effect being a very considerable shortage in yield, which, however, was more or less general throughout Ceylon.

In the face of the unfavourable climatic influences, the Directors are glad to learn that the Estate is in excellent order, and with ordinary weather there is good promise of the current year showing satisfactory results.

The accounts now presented show a surplus of £18,051 19s. 11d., made up of Dividend Fund, £12,878 8s, 9d., and Profit and Loss, £5,173 11s. 2d., after writing off the amount of Tea Extension, viz., £305 5s. 4d., and the amount of the Factory and Machinery Account, viz., £22 1s. 0d. The Directors propose a dividend of 20 per cent. per annum for the year ended June 30th last, 5 per cent of which was paid in March, and the placing of £1000 to form the nucleus of a Reserve Fund.

The Directors wish to record their appreciation of the care and attention paid to the Company's interests by Mr. Dick Lauder and the staff in Ceylon. Mr. Dick Lauder is at present in England, and the Directors have had the advantage of conferring with him on the management and prospects of the property. By order of the Board,

A. Crabbe, Secretary.

SOUTH TRAVANCORE TEA COMPANY, (LIMITED).

The third annual general meeting was held yesterday at the offices, Philpot-lane. Mr. T C Owen presided, and, in moving the adoption of the report, stated that for the year to June 30 last the outturn of tea had been 337,961 lb. (being 37,961 lb. above the original estimate), against 242,046 lb. last year. The average price realized had been 6.03d per lb. as against 5 55d last year and 5·85d the year before. The gross profits had been £3,339, against £1,304 last year and £1,672 the year before. After writing off the whole of the preliminary expenses and the cost the debenture issue, amounting to £521, and after providing £250 for the debenture sinking fund, the net profit had been £1,794, which with the amount brought forward left £1,980 out of which the directors proposed, after meeting the preference dividend for the year, to pay dividend at the rate of 5 per cent on the ordinary shares, leaving £468 to be carried forward. The motion was seconded by Mr. R F White, and adopted. The chairman afterwards proposed the payment of the dividend mentioned on the ordinary shares. For ordinary shareholders, he stated, had received no dividend since the first year after the company started, but their financial position certainly justified a dividend on the present occasion. The motion was seconded and adopted. The chairman expressed a hope that the board would be able to pay an increased dividend next year, the preliminary expenses and the cost of the debentnre issue having been extinguished, and the amount carried forward representing half-a-year's dividend on the preference shares. The directors were proceeding carefully as regarded the question of extensions. During the past year they resold two outlying portions of land to the vendor for £1,985. The area under tea now amounted to 722 acres, of which 700 acres were in bearing, the remainder being the young tea. The present price of tea showed an average of ½d in excess of that of the corresponding period of 1898, and the quantity of tea which the company had was larger by between 8,000 lb. and 9,000 lb.—London *Times*, Oct, 3.

LONDON CHARGES OF TEA COMPANIES.—II.

(The *Investors' Review*, Sept. 23.)

THE TEA CLEARING HOUSE.

In this article we propose to deal exclusively with the warehouse and dock charge upon tea, about which there is so much complaint, and to start with cannot do better than quote the schedule of rates supposed to apply to every package of tea that goes through the Tea Clearing House. This is as follows:—

CHARGES ON TEA.

To apply to all parcels by ships reporting on and after July 1, 1888.

		Per package, weighing gross					
		130 lb. to 159 lb.		90 lb. to 129 lb.		80 lb. to 89 lb.	
		s	d	s	d	s	d
Landing and housing rate	..	1	10	1	6	1	4
Management rate	...	2	3	1	10	1	8
Bulking and taring	...	1	8	1	5	1	3
Bulking, taring, or weighing net separately	..	1	3	1	0	0	11
Rent per week	..	0	0¾	0	0½	0	0½

The above charges will be subject to a discount of 10 per cent to importers only.

For determining the class under which the break is chargeable, the average gross weight must be ascertained. When the fraction of the average weight is half a pound or more, the dock companies or warehouse-keepers take the benefit. Thus, the average of a break being 79½ lb gross, the whole break will be rated at 80-89 lb, but the average being less than 79½ lb, the whole break will be rated at 60-79 lb.

For the sake of bringing the table into manageable shape, we have deleted the rates upon certain exceptional sizes which are seldom used by importers. The general size of the packages is from 90 lb to 129 lb, and in all calculations made in these articles we have taken the rates upon these weights as our basis, allowing the usual deduction of 23 lb for the weight of the tare. The charges of most importance to the importer are "management rate"—i.e., the working of the tea—"bulking and taring," and "rent." The management rate includes the landing and housing rate, and a large importer has defined the services rendered for this charge in the following terms:—

"Landing, wharfage, conveyance to warehouse, housing, sampling for importer and broker, sorting to marks and descriptions, weighing, examining for damage, laying down for broker's inspection, and attendance on broker, laying out in showroom for public sale, attendance while on show and sampling, adjusting to weights after sale, coopering, nailing down, trucking and piling for delivery, reweighing and delivering to land conveyance. The rate also includes furnishing warrants and landing accounts."

SAMPLING AND SORTING.

Although this sounds formidable, an examination will prove that the greater portion of it represents work which is quite superficial. For instance, in "sampling for importer and broker" only one chest in a break is sampled, and when it is considered that a break consists more often of fifty chests than less, it is apparent that this entails no great amount of work. "Sorting to marks and descriptions" is for the convenience of the wharf in delivering. "Weighing" is only weighing the chest gross as it arrives. "Examining for damage, laying down for broker's inspection, and attendance on broker, laying out in showroom for public sale, attendance while on show and sampling," are quite small items in dealing with a large number of chests. "Coopering and nailing down" applies to the sampled chests only, and although the rate includes furnishing the warrants, it does not include the warrant stamp (3d per warrant).

BULKING AND TARING.

"Bulking and taring" are rates that do not apply to every package. Teas are not infrequently bulked on the estate, and when this is done they are very rarely rebulked. In regard to taring, according to the Customs regulations, a certain number of chests in every break must be tared from the gross weight of the package, in order to ascertain the amount of duty to be collected. Should there be a variation of more than a couple of pounds in the weight of the chest, nails, and lead—*i.e.*, the tare—each chest of the entire break must be tared, involving the heavy charge of 1s per package throughout. In regard to "rent," all teas are sold on a "three months prompt," and rent is charged for these thirteen weeks, less five weeks, the rent for which is included in the "management of rate." In most cases buyers take delivery of the tea within two or three weeks of the auction; but, however soon they may do this, the eight weeks' rent charged upon the tea, to make up the three months, has to be paid by the importer.

THE LONDON RING.

We have been at pains to explain the actual charges complained of by producers, and will now proceed to point out why they are considered onerous, but before doing so must first draw attention to the fact that the whole of the bonded tea warehouses in London are in a "ring." Treating the London and India Docks Joint Committee as one body, there are nineteen tea warehousing firms in the Tea Clearing House, which clearing house has a large number of subscribers, including all the principal buyers and brokers in the trade. According to the rules of the Clearing House, "No subscribers shall be entitled to warehouse or deposit tea with, or employ in connection with tea, any dock company or tea warehouse-keeper who is not a member of the Clearing House, or to purchase or sample any tea from the warehouse of any non-member." The "ring," therefore, is most complete, for should a dissatisfied body of importers attempt to start a co-operative warehouse of their own, they find that they have the whole of the tea trade banded against them under the rules and regulations of this clearing house. We shall have more to say about this matter later on.

THE MANAGEMENT RATE.

Returning to the subject of the charges, it is clear, both from internal and external evidence that they are excessively high as consideration for the services rendered. First we will deal with the internal reasons that lead us to this conclusion. There is a charge, not given in our table, but sometimes required, for "reshowing for public sale" of 1s 4d per package, and if this is added to the "landing and housing rate" of 1s 6d per package, we get a combined rate of 2s 10d per package for performing exactly the same services as those

covered by the "management rate," excepting that each package has to be handled a second time. For this second handling a charge of 1s per package is thus demanded, which is absurd when the small amount of labour and time involved is taken into account. Then "bulking and taring," if done together, are charged at 1s 5d per package, but if done separately the two operations cost 2s per package. Now the sole difference produced by dividing the operations into two is that each package of tea has to be opened and closed twice instead of once, and for this additional opening and closing of a chest of tea the charge of 7d is made. Just imagine what wages workmen with all the skill produced by handling thousands of these chests in a year would earn if they were enabled to charge the warehouse-keepers anything like this price for their time and labour!

THE WAREHOUSING OF TEA, PROFITABLE.

Secondly, we assume that the warehouse charges are exorbitant, from this external or public reason—there is the keenest competition amongst those engaged in the warehousing business to secure the handling of tea. However, much warehouse charges in other trades may be cut it is admitted on all sides that the warehousing of tea is the most profitable. Hence it affords a fine broad margin, and in spite of the most stringent regulations against the "cutting' of rates, or the granting of special privileges to individuals or companies, we believe that a great deal is done by warehouse-keepers in both directions in order to obtain new business. We know for a fact that discounts greatly in excess of the official 10 per cent have been allowed to certain companies, and this has sometimes been done in a fashion that verges on the dishonourable. However that may be, the questionable habit certainly flings the door open to fraud on the part of managing directors and other officials of tea companies. One case in particular is in our recollection. We have carefully altered the figures, but the actual results were proportionately as we state. Let us assume that the company in question handled 20,000 chests of tea in the year, the dock charges would have been nominally £4,392, upon which the fixed 10 per cent discount would have come to £439. As a matter of fact, £1,098 in discount was allowed, and the £661, or rather the proportionate actual figure, was paid over in sovereigns so as to avoid unpleasant documents in the nature of evidence that the bond of the "ring" had been ignored. The officials of the company that received this extra money were practically told, "We don't care what you do with this money; but do not let the fact that this extra discount has been granted leak out." Subsequently, complaint was made that the company's officials, acting in perfect honesty, had put down the true amount paid by the company for dock and warehouse charges, and not the amount allowed by the rules, in its accounts. This led to awkward questions being put to the warehouse-keeper by his brethren as to why the rates worked out so low. What his answer was we do not profess to know.

THE IRON BOUND "RING."

It follows that abuses of the most serious kind are fostered by this combination to enforce high charges on tea, and an iron-bound "ring" and the practices known to be adopted to dodge its exactions are calculated to cast a slur upon the whole body of gentlemen connected with the trade. So grievous have the complaints become that many of the warehouse-keepers would welcome a reduction in rates, or rather an increase in the discount allowed. We believe that a motion to this effect was proposed to the members of the Tea Clearing House not long ago, but the suggestion was rejected mainly owing to the energetic opposition of the representative of an important warehouse-keeping firm. Yet we are informed on very good authority that this very firm has granted a discount considerably higher than the official 10 per cent in order to obtain new business or retain some of its old. We, therefore, think that importers are fully justified in asking for a liberal revision of, or an increase in the discount upon, these charges to at least 25 per cent. The business would even then pay very well, and there would not be the sore and angry feeling prevalent that one tea company may be paying the official rate, while another is obtaining a secret and dishonest reduction, or, worse still, that some official may be personally benefitting by corrupt and corrupting discounts to the detriment of the company he represents. Energetic action on the part of the tea trade as a whole in regard to this matter is rendered difficult by the very nature of the ownership of tea warehouses; but this is a large matter in itself, and we will deal with that branch of the subject next week.—*Home and Colonial Mail.*

PLANTING NOTES.

COLONIAL GOVERNMENT GEOLOGISTS : CEYLON NEXT ?—We read in the London *Times* of Oct. 6, that Mr. W. H. Twelvetrees, F.G.S., has recently been appointed to the position of Geologist to the Government of Tasmania. During recent years Mr. Twelvetrees has devoted considerable attention to the Geological formation of Tasmania, with special reference to mining operations. Can Ceylon boast no scientist who has been performing similar work here and one who may become a valuable member of the *coming* Geological Survey Department? Mr. Oldham's advice, that no special work with a view to mining operations should be undertaken by the servants of Government, will scarcely, it appears to us, be that followed in Tasmania.

CINCHONA PLANTERS will be interested to learn that a new species of cinchona has been discovered. Mr. Standen, the Director of the Government Cinchona Plantations in Madras, is declared to be the discoverer; but he will, no doubt at once deny the bold impeachment. However, we have the authority of the *Bombay Gazette* for the statement, in a leading article in its issue of the 17th instant, that Mr. Standen has reported that "further attempts should be made to cultivate sedgers from seeds obtained from Java," that "sedgers" should be grafted on succirubra, etc.; the "original sedgers" give the "phenomenal return of 741 pounds per acre per annum.' Verily, the wiles of the "printers' devils" and the troubles caused by illegible writing are legion. It is perhaps hardly necessary to state that our contemporary is really alluding to ledger seed through out its lengthy leader.—*Madras Mail*, Oct. 19.

Correspondence.

To the Editor.

THE 4-D IMPORT DUTY ON TEA.

Dear Sir,—As a regular reader of the Ceylon papers and being deeply interested in your island's chief industry, I feel compelled to notice some points wherein the local opinion differs materially, from that held by those residents in England.

First, I will take the 4d import duty upon tea into Great Britain, for it seems to be the opinion in Ceylon that by reducing or abolishing this, that the market will at once be flooded with common foreign teas, and there also appears to be an idea that the last reduction by Mr. Goschen's, tended to lower prices to the producer, in some unexplained manner. It is very difficult to understand how such opinions have been formed.

A country pronounces a decided preference for a certain class of teas and this has most decidedly shown itself in Britain for those of a British growth. Reduce the duty and I fail to see how the taste will be in any way altered. It is a distinctive choice between two classes of tea. The duty as above referred to came down 2d, yet the relative position of China, as against British grown, has in no way altered except to the further detriment of the former.

A family drinks either, tea, coffee or, cocoa; and it is reasonable to suppose that any reduction of the duty on tea would mean a falling off in the consumption of the other two articles. It is generally stated that during the past two years, cocoa has been much more extensively used, and that even coffee is obtaining more attention; attributable no doubt to their present cheapness. To my mind the position of these three articles will always be depended upon their relative cheapness, and according to this, they will either individually give way, or, supersede one another. It is entirely an economic question. When tea and coffee forty years ago more nearly equalled one another in price, their relative consumption was more equal; now tea is so much cheaper, it has outrun coffee. In like manner the coarsest plucked Ceylon and Indian would always undersell cheap China, from the fact that the latter needs more to make a cup; each pound of which will have to pay duty. In other words, to make a gallon of tea, China tea will have to pay fifty per cent more duty.

I have not the data to go fully into the question just now, but would it not be fairer to consider British-grown teas, as instead of being opposed only against China, as arranged against China tea, cocoa and coffee? You, Mr. Editor, have figures that could show the relative consumption of all these in the British isles, the subject could thus be considered in its wider light, for they are without doubt all convertible articles, according to economic value, I believe.

Political economists one and all tell us that reduction of price increases use; so without doubt the reason why consumption has doubled within the last 30 years is that the sale price has gone down to less than half, helped in a measure by lower duties. It is quite inconceivable to an economist, that any other result can ensue.

If there be a want in London, it is a greater unanimity of opinion among producers, as against distributers and consumers, notwithstanding what may be said to the contrary. It is nobody's business at present, so the individual and proverbial sticks are broken singly. For instance, last year a large quantity of inferior China tea was rejected from entry into America, *as unfit for human food* which promptly found its way into London, where it was sold, distributed and consumed, without molestation, there being no sufficiently authoritative machinery to interfere.

Then again,—the largest tea distributer in the world advertizes teas as follows:—1s, 1s 4d and 1s 7d per lb., the last being declared *the finest tea the world produces.* Now let us follow these prices. Collectively they work out to an average of less than 1s 4d per lb. Take off 4d duty; 3½d (a very low allowance) for retailing: 1½d for blending, packing, advertizing and distributing and 7d gross is left for the producer or 6d net. I doubt if Ceylon can *on an average* over some years put its tea in London under 5d net, if any reasonable provision is made for wear and tear of property. If these calculations are right 1d per lb., is left as profit for the grower; thus capitalizing all tea land coming within these limits, say at 10 years purchase and 400 lb., to the acre, at a value of under £17 the acre. No, the reasons for the fall in the price of teas, lies not to the blame of reduced import duty but, to far more direct causes, which I may enter upon later.

It was to support this *first appearance of unanimity* among producers in London, that I, much on the grounds and principles of a party government, supported the 1 lb. draft; although I considered a better proposal could easily have been found.

SUUM CUIQUE.

THE PROPOSED COFFEE ASSOCIATION.

A SCHEME FOR DIRECT SUPPLY.

9, New Broad Street, London, E.C.,
2nd Oct., 1899.

Sir,—As I find that many coffee planters in your district, as well as in the Federated Malay States and in the Dutch East Indies, are manifesting a great interest in the movement I initiated recently for the organisation of an association of producers of coffee, with the object of stimulating the consumption of the article and generally to protect the interests of those engaged in the industry, I beg that you will grant me space in your columns to reply to the numerous correspondents who have addressed me on the subject. I will thus be enabled to give fuller particulars with regard to the objects and progress of the association. I should explain that I was led to take up this matter, in the first instance, in view of the heavy losses which are being sustained by the producers in Brazil and Central America, with which countries my paper, the *South American Journal,* has been for so many years associated. Consequently the final programme of the Association have only been published in the prospectus in the Spanish and Portuguese languages. These are now being largely circulated in the countries mentioned. The Government of Brazil has manifested a great interest in the scheme and has asked me to supply a large number of pamphlets to be distributed officially. The Consuls of the coffee-producing countries of Central America and of Mexico have also sent out quantities of pamphlets to their Governments, and many merchants in London, Hamburg, Havre and elsewhere, have sent copies to their correspondents. I send you herewith specimen copies.

It is obvious, however, that the success of the proposed Association will be more assured if the coffee growers throughout the world should take part in it.

The Editor of the *Indische Mercuur*, of Amsterdam, has kindly offered his co-operation in bringing this matter before his countrymen in Java, Sumatra, etc., where about sixty of the leading planters have already intimated their approval of the scheme.

Probably this letter may lead to the planters in Ceylon, &c., taking some definite action in the matter.

As explained in the Spanish prospectus, the original idea was to form an Association principally for propaganda purposes, to impress upon the public the peculiar merits of coffee and to instruct them how to prepare it. It was suggested that this institution should be supported by a small levy, voluntarily, or legally, imposed upon each bag of coffee exported.

Upon going into the matter more closely, however, I soon perceived that this plan was encumbered by so many practical difficulties that to carry it out to a satisfactory issue would be almost impossible. These I have alluded to at length in my pamphlet. Amongst them I may mention the delay which would necessarily have to take place before all the coffee-producing countries of the world could be got to agree to the assessment; the impracticability of arriving at a general agreement as to its amount, the difficulty of its collection and of being able to estimate in advance the amount of revenue likely to be derived from it; the danger of official interference in the management, and many others, which will immediately occur to business men.

It became evident that the Association could only succeed if founded upon a commercial basis.

Fortunately it will be easy to do this under the conditions which now exist, and are likely to prevail for some long time to come in the coffee markets of the world. It is well known that the retail prices have not yet fallen in any degree proportionate to those which rule in wholesale quotations; also that coffee is sold largely adulterated in most European countries. From these circumstances it results that there is a spendid profit to be made by any Association, or Company, which will take up the business of coffee-roasting on scientific principles upon a large scale, whilst by the issue of coffee, guaranteed pure, at moderate prices, all adulterations could be driven from the market, whereby consumption of coffee will be greatly increased. I have gone carefully into this matter, and have made elaborate calculations as to the profits, which are most alluring. My estimates have been verified by people who have had great experience, and it is probable that, whether the planters give their support or not, there will soon be several large roasting factories established in England, using the machinery which I have discovered to be the best, as by it a great saving is made in the process.

It will be much better, however, if these factories are owned and controlled by an Association of producers. If started by commercial speculators, the interest of the proprietors will be to keep the wholesale prices of coffee as low as possible, whereas the producers, having a wider view, could devote some of the profits to propaganda, which would ultimately lead to a more general consumption of coffee.

If I find that there is a real interest taken in this business I shall have much pleasure in publishing the full detailed prospectus in English. The plan at present is to form a Company with a capital of £60,000 in shares of £1. each.

There is another important function which an association of coffee-producers could perform, to the great advantage of its shareholders, namely that of acting as their commercial agent; as the consignee of their coffee and the supplier of their stores, I have perceived this ever since I arrived at the conclusion as to the best plan of organising the company; but I have not sought to emphasise the point as I hoped and desired that I would have the support of merchants on this side in my efforts for its promotion. As, however, these gentlemen have now shown themselves to be either apathetic or covertly hostile to the scheme, there is now no object in keeping it dark, especially in a letter addressed to planters. Many of your readers must know from experience that their European correspondents do not always take the pains they ought in order to secure the best prices for produce consigned to them. In too many cases it is simply handed over to a broker to be "slaughtered," at any price it will fetch. A co-operative association of planters however, formed upon the lines I have set forth, would have its own large body of consumers which it would reach directly and many intermediate commissions and expense would be saved. Besides this, all the profits now derived by merchants from sale commissions or purchase of supplies would come into the treasury of the association and back into the pockets of the planters themselves in the shape of dividends. I hope the considerations I have mentioned will be sufficient to lead the planters of your district to take an active interest in the scheme.—I am, yours &c.,

JOHN SAMSON,

Joint Editor and Director, *South American Journal.*

MOSQUITOS—SPECIES ANOPHELES AND CULEX.

London, Oct. 3.

Sir,—The readers of your paper may like to make search for mosquitos, and they will have no difficulty in finding a good selection and so be able to ascertain if there are any of the Anopheles species among them or if they are all of the Culex species.

The detail of work performed on the West Coast of Africa is now published and the reports sent home are so simple and practical that I make free to quote a few remarks from them.

When the mosquito is found on the wall you have to note if his body, with the tail, is parallel with the wall; if so this species is the Culex and does not carry the germ of malaria; whereas if a mosquito can be found with the head pointing into the wall and the legs sustaining the body in this position and vertical to the wall, that is to say the body projecting at right angles from the place on which the insect is resting, then it belongs to the Anopheles variety and it should be carefully destroyed and a note taken of its existence.

The report gives particulars as to where the Anopheles variety is to be found. The Anopheles is a puddle-breeding mosquito: it requires puddles to breed in, but puddles of a certain kind; hence the importance of the subject. They were found in shallow roadside puddles containing water weed in the middle of the town; then some in a tub. The principal sources yet discovered consist of little pools lying in small flat areas in the towns: here the larvæ are in large numbers and are evidently in presence of the conditions most suitable to their existence. Although search has been made, as yet very few puddles have been discovered to yield this larvæ.

The whole report is most interesting reading and no doubt it will soon be in the hands of the public.—I remain, Yours truly,

THOS. CHRISTY, F.L.S.

TANNING BARK.

Oct. 20.

Dear Sir,—In your comments on "Our Import and Export trade" in the *Observer* of 14th inst., you refer to the bark supplied by me to Colombo tanners as that of acacia *dealbata*; and as the same note appears in the 1898-99 Directory, I write to put you right on the subject. Acacia *decurrens* is the variety I cultivate for bark (and fuel). The bark of acacia dealbata is very poor in tannic acid as reference to your copy of Maidan's "Wattles and Wattle Barks" will show you. In a few years' time "acacia bark" should appear in a list of Ceylon exports as I sell large quantities of seed every year. Southern India is also taking it up.—Yours faithfuly,

A. J. KELLOW.

THE CEYLON TEA INDUSTRY.

(*Pioneer*, Oct. 21.)

From an address by the Lieut.-Governor of Ceylon to the Legislative Council of that island, in opening the winter session, it appears that, in spite of the ruinous influences of a one and fourpenny rupee, the tea industry in Ceylon is in a sounder and better position financially than ever: and the limit of development is not yet reached. Big as is the present area under tea, large tracts of new tea-land have still to come into bearing. Hitherto the energy of those interested in increasing the consumption of Ceylon tea in foreign lands has always availed to keep the demand well abreast of the supply; hence no anxiety is felt regarding the disposal of the increased production of the future. Not every garden of course is doing well: some estates indeed are now working at so fine a profit margin that any appreciable fall in price must throw them out of cultivation. But unstable concerns of this sort are few in number and form the exception to the general rule. The Lieut.-Governor did not pause in his jubilations to inquire why tea planting pays so much better in Ceylon than in India, but he may have realised that the answer to the question does not lie on the surface. One thing however is patent to anybody,—that whereas Ceylon planters command an abundance of cheap labour, Indian planters are always crying out for coolies. In every productive enterprise the labour supply must be the dominating factor, and so long as the teaming millions of Bengal remain loath to leave their village homes for distant tea gardens, Indian planters will continue to be handicapped.

OTTERY TEA COMPANY OF CEYLON.

REPORT OF DIRECTORS.

The Report of the Directors was submitted as follows:—

The Directors have now the pleasure to submit to the shareholders their Report and Accounts for the year ended September 30th, 1899.

The Crop secured was 141,555 lb. against an Estimate of 160,000 lb., the shortage being due in great measure to unfavourable weather.

After deducting R1,000 from Reserve Account, as arranged last year, to pay for part of the amount spent on Manure, viz., R2,827·60, the Tea has cost laid town in Colombo cts. 27·31 per lb., or without Manure dcs. 26·02 as against cts. 25·05 last year.

The nett average price realised was cts. 46·91 as against cts. 42·40 last season, which may be considered very satisfactory.

After making provision for the Interest on Mortgage, &c., the balance of profit available amounts to R24,466·52. Of this amount R8,940 was absorbed by the payment of an interim dividend of three per cent to 31st March last, and the Directors now recommend that a final dividend of five per cent be paid, absorbing R14,900, that a Bonus of R500 be paid to the Superintendent, and that the balance of R126·56 be carried forward to the next Account.

In the terms of the Articles of Association Mr. W. Kingsbury resigns his seat on the Board, but, being eligible, offers himself for re-election.

An Auditor will also have to be appointed for season 1899-1900.

PRODUCE AND PLANTING.

Tea and Coffee in the United States.—Statistics issued by the New York Coffee Exchange show the remarkable increase in the consumption of coffee in the United States. Formerly a 10 per cent gain in consumption from one year to another was regarded a maximum increase, and even this was the exception and not the rule. But the New York correspondent of the "Grocer" properly points out if Americans would use Ceylon and Indian tea instead of China and Japan growths, then they would have a cheaper beverage than when using coffee, for one pound of good British-grown tea will make sixteen gallons of beverage at a cost of about 1¾d per gallon. Slowly, but, it seems, surely the people begin to learn how to make a right use of Ceylon and Indian tea, but there is an aversion to using them alone, and so the majority of such tea is used for blending. The imports of tea for three years, ending June 30, were as follows: 1899, 74,088,153lb; 1898, 71,957,715; 1897, 113,347,175lb. The imposition of a duty of 10 cents per lb. and the Tea Exclusion Act have also hurt the tea industry, a point disputed by those who favoured the tea law establishing standards. The imports of coffee were as follows: 1899, 831,820,341lb.; 1898, 870,514,455lb.; 1897, 737,645,670lb. Coffee is relatively the cheaper beverage, which accounts for the fact that it is growing in popularity, while tea is 25 to 50 per cent higher than it was three years ago.

Australia and the Pound Draft Question.—Trade opinion in Sydney are elsewhere was, as a rule, in sympathy with the effort of tea producers in their recent struggle to secure the abolition of the one pound draft. The impression in Australia seems to be that Indian and Ceylon producers should not only have been in thorough and complete harmony on the subject, but careful preparatory measures should have been taken both in London and India and Ceylon before the move was made.

They will have Tea.—It will interest tea producers to learn that tea is so popular with the public that any attempt to restrict its supply in the cup by those who prefer to push the sale of intoxicants is met with an outcry. Cyclists have complained loudly of the difficulty they experience in some parts of the country in inducing rural Boniface to supply tea. Numerous letters have appeared in cycling and other journals on this subject. It is suggested that the Cyclists' Touring Club should "take up the cudgels and fight this matter out."—*H. and C. Mail*, Oct. 6.

INDIARUBBER IN QUEENSLAND.

The following from the *Brisbane Courier* will be of interest to those on the Northern Rivers who may contemplate taking up an industry that if carefully attended to may lead to an increase in the articles of production from this colony (New South Wales):—"The news from Cairns that a number of local men are arranging to begin operations in the manufacture of indiarubber is important. The raw article can be obtained from indigenous trees in the shrub, and is said to be of first-class quality. What is perhaps more important, the supply is inexhaustible. One of the chief values attaching to the recent New Guinea concession was the practically unlimited quantity of rubber there obtainable. To find, therefore, that a similar condition of affairs exists within easy distance of a port like Cairns is to say the least encouraging. Then, as regards the industry itself, its outlook is as bright as it possibly could be. The marvellous demand for bicycles of late years has given an immense impetus to the rubber trade. Indiarubber being also a highly perishable article is another important factor in the question of supply and demand. The demand will always exist, so the supply must be kept going. There is one consideration, however, which these Cairns men will find obtruding on their notice sooner or later. That is the question of chief labour in collecting the article. This must be considered when it comes to competing with others. In New Guinea, for instance, labour is cheap and on the spot. Here in Australia we have practically none of this native labour. The nearness to a port

for shipment may counterbalance this advantage which New Guinea rubber traders would derive from a handy labour supply. Our Department of Agriculture has during the year been trying by a series of articles to direct attention to this industry. Its progress will be watched with much interest. It will also place another string on the Cairns bow in raising that town into a place of much importance in the future."—*Sydney Mail*, Oct. 7.

THE INDIAN TEA INDUSTRY.

In his remarks regarding the position and prospects of the Indian tea trade, Mr. O'Conor, in his Annual Report, concerns himself chiefly with the question, whether the demand for China tea in the British market is likely to undergo a further reduction; but he also touches, incidentally, on the effect of the closing of the Mints on the trade. In connection with the question of the effect of the closing of the Mints, he appeals to the fact of its not having brought about even a momentary pause in the substitution of Indian for Ceylon tea as "another proof, if one were wanted, that a bad currency system does not promote trade, and that a good currency system cannot injure it." Here, however, he seems to us to miss the real point at issue. No one imagines that a bad currency system promotes trade or a good one injures it. Most of those who complain that the closing of the Mints has injured the Indian tea industry would probably maintain that the currency system if introduced was not a good, but a bad one. But, admitting for the sake of argument that it was as good a system as that which it replaced, there still remains the question whether the transition from one the system to the other was not calculated to injure the industry, at least temporarily. Regarded as a permanent fact, one rate of exchange is, doubtless, as good for trade as another. But it can hardly be doubted that a rise in exchange must have an injurious effect on the profits of the producers of a commodity like tea for export to a gold standard country, pending adjustment, which, whether it is brought about through contraction of production, or through a reduction of the cost of production, is a more or less tardy process. The fact, moreover, that the closing of the Mints brought about no pause in the decadence of the China tea trade, is no proof that the Indian industry was not injured by it. All that it necessarily shows is that the injury, if any, was not great enough to produce that particular result. On the whole, it may be regarded as morally certain that, if the rupees were suddenly to be depreciated to such an extent as to enable India to undersell China, she would have a much better chance of obtaining an entry for her tea into foreign markets than she has at present.—*Statesman.*

COCONUTS IN THE PHILIPPINES.

There are several species of cocoa palms growing in the Archipelago, but the ordinary coconut tree (*Cocos nucifera*) is the most important. The Indians make use of it in a good many ways, but only the principal ones need be enumerated. The kernel of the nut they use for food, while the liquid the shell contains makes a refreshing drink. If allowed to stand for some time, this liquid forms a very agreeable milky juice that is realised not only by the natives, but by Europeans as well. After this juice has coagulated, it is mixed with sugar and made into bonbons, known as cocoa sugar, and also into various other delicacies. According to a recent report of the United States Department of Agriculture, by tapping the central bud that crowns the coconut, a kind of wine, called *tuba*, of an agreeable pungent taste, is produced. This *tuba*, when allowed to ferment, produces vinegar, and when distilled, a kind of brandy, that is highly relished by the natives. From the husk of the coconut the Tagals make ropes and cords, and a material for calking their boats. From the woody shell they carve spoons, cups, beads for rosaries, and many other articles. The leaves they use to cover the roofs of their houses. Roofs made in this manner are thick and tight, but they have the disadvantage of burning readily, so that in the towns and villages where the houses are thus covered, conflagrations spread with great rapidity. The veins and smaller ribs of the leaves are used to make brooms, the midribs serve as fuel, and the ashes are utilised in making soap. The trunk of the palm is made to serve as a pillar to support the houses that its leaves overshadow. Oil barrels, *tuba* casks, and water-pipes are fashioned from hollow sections of the trunk. From the roots the natives extract a red dyeing material, that they chew in place of the areca palm nuts or *bonga* when the latter cannot be procured. Large quantities of coconut oil are manufactured in the Philippines. This oil is much prized by the natives. The men and women both use it to anoint the thick growth of hair that adorns their heads, and it thus finds a ready sale at remunerative prices. It is also used in the lamps that take the place of gas-burners in the streets, and in those used by the natives and Chinese in their houses. Manila exports annually about 150,000 pesos (£25,000) worth of coconuts to China and British India, and about 30,000 pesos (£5,000) worth of coconut oil to China.—*Journal of the Society of Arts.*, Oct. 6.

CACAO IN THE PHILIPINES.

"Theobrama Cacao" (Food of the Gods) as Linnaeus called it, a native of Central America flourishes in these islands in the hot damp regions.

It is said to have been imported into the Philippines towards the end of the 17th Century from Mexico, where it has been in very ancient use. Outside the tropics, the tree will grow in some places, but gives no fruit. The Philippine quality is very good, and compares favourably with that of other countries, the best being produced between latitudes 11 and 12 N.

The cultivation of Cacao is an extremely risky and delicate business as, often when the planter's hopes are about to be realized, a slight storm will throw down the almost ripened fruit in a day. A disease sometimes attacks the roots and spreads through the plantation. It is natural therefore, that no one should dedicate his time exclusively to the cultivation of this product at the risk of almost instantaneous ruin. Usually, the Philippine agriculturist rightly regards cacao as a useful adjunct to his other crops. Small quantities of it are sent to Spain, but the consumption in the colony, when made into chocolate by adding sugar, vanilla, cinnamon, etc., to counteract the natural bitterness of the bean is considerable. To make chocolate-paste, a large quantity of sugar is added varying to one third of its weight to equal parts, whilst one pod of vanilla is sufficient for 1½ lb. of Cacao. As a beverage it is in great favour with the Spaniards and half-castes and the better class of natives.

The cacao beans or kernels lie in a fruit something like a gherkin about five inches long and three inches in diameter, and are of a dark reddish colour when ripe. The fruit contains from 15 to 25 beans, in regular rows, with pulpy divisions between them, like a water-melon. The kernels are about the size, shape and colour of almonds, obtuse at the end, and contain a fatty or oily matter to the extent of one-half their weight. In order to make "soluble cacao" as sold in Europe, this fatty substance is extracted.

The beans are planted out at short distances in orchards, or in the garden surrounding the owners dwelling. The tree, in this colony, does not attain a great height—usually up to ten feet --whereas in its natural soil it grows up to 30 feet at least. Like coffee it bears a fruit in the fourth year, and reaches maturity in the sixth year. The fair annual yield of tree, if not damaged by storms or insects, would be about three pint measures of beans, which always find a ready sale.

If all went well, and present prices, more or less, were maintained, large profits might accrue to the planter, but it rarely happens (perhaps never) during the six months of fruit ripening that losses are not sustained by hurricanes, diseases in the tree, the depredations of rats and other vermin etc. Practically speaking, cacao-planting should only be undertaken in this colony by agriculturists who have spare capital, and can afford to lose a crop one year to make up for in it the next, of planting to be taken up by hand-to-mouth colonists who must seek immediate returns.

In the aspect of a cacao plantation there is nothing especially attractive. The tree itself is not pretty. The natives who grow the fruit, usually make their own chocolate at home by roasting the beans over a slow fire, and after separating them from the hulls (like almond skins, they pound them with wet sugar etc. into a paste, using a kind of rolling-pin on a concave block of wood. The roasted beans should be made into chocolate at once, as by exposure to the air they lose flavour. Chocolate is often adulterated with roasted rice and vily nuts. The roasted Pili nut alone has a very agreeable almon taste ; the cacao bean itself, in its pure state, is extremely bitter and unpalatable.

In Manila there is a steam power manufactury which partly supplies the capital with good chocolate, and which will receive our attention in a subsequent article.—*Manila Times*, Oct. 4.

SELANGOR PLANTERS' ASSOCIATION.

The following are parts of minutes of a General Meeting held in the Selangor Club, Kuala Lumpur, on Saturday 30th September. Present :—Messrs. W. W. Bailey, (Chairman) J. D. Toynbee, C. Meikle, E. V. Carey, L. Dougal, E. B. Prior, (members of Committee). H. Huttenbach, H. M. Darby, E. F. King, F. B. Hicks, E. B. Skinner, W. Brooke, W. Irvine, A. Barnwell, F. Newman, A. Cathcart, H. C. Rendle, J. H. Power, T. S. Dumbreck, W. McD. Mitchell and Tom Gibson, Hon. Secretary.

QUIT RENTS ON COFFEE ESTATES.

Mr. Dougal proposed and Mr. C. Meikle seconded the following resolution, *viz* :—

"That in view of the distressed condition of coffee planting in the State, the Government be asked to remit the quit-rent on all blocks of 200 acres and upwards until such time as prices improve." Mr. Dougal said that the present depressed condition of the planting community was only too evident, and although it might appear that the question of quit-rent was a small matter, still every little helped. In approaching Government now and asking for this help we do not forget what Government has already done for us, such as help rendered to fight the caterpillar pest, remission of export duty and Hospital fees etc., but all the same he felt confident that this assistance would also be granted us if asked for.

Mr. Meikle reiterated what Mr. Dougal had said as to the present depressed state of planting and assistance already rendered by Government to the planters, and also thought our request would be granted.

Mr. Huttenbach said he would be only too glad if Government could be induced to let us off the quit-rent altogether, but was afraid they would not do so, and he would suggest that we ask Government to let the quit-rent remain in arrears, making the debt a first charge on the Estate, and when times improve the amount due could be paid up without inconvenience.

Mr. Dougal said he thought it would be most objectionable to have a debt such as this hanging on our heads.

Mr. Hicks suggested as an amendment that Government be asked to remit the quit-rent on the unopened portions of Estates until better times.

The Chairman said he was glad to see that the general feeling was that we should not ask too much ; he was also certain that Government would not care to keep a debt hanging over us, but the amendment seemed to meet the case admirably.

Mr. Meikle proposed and Mr. Nicholas seconded the following resolution, viz. :—"That the attention of Government be again drawn to the unsatisfactory condition of the coconut trees in the Kuala Lumpur and other districts where the ravages of beetels are still very marked—where insufficient steps are being taken to keep this pest in check and that Government be asked to see that the Coconut Trees Preservation Ordinance be more rigorously enforced." Mr. Meikle said that for the present coffee had gone to the bad and coconuts were looked upon by many as a safe investment, and a good deal of capital was being sunk in planting coconuts in Selangor

Mr. Nicholas said he had much pleasure in seconding Mr. Meikle's resolution and agreed with all he had said as to the unsatisfactory way in which the Ordinance had been carried out.

THE COOLIES QUESTION.

The next point to be considered was a resolution proposed by Mr. Hutterbach as follow. "To cancel the agreement which prohibits members of the S.P.A. from engaging Tamil coolies locally without the goodwill and permission of their former employers" and the Chairman asked Mr. Huttenbach to name his seconder.

Mr. Hicks said he would second it. Mr. Huttenbach said the object of the agreement he proposed should be cancelled was to protect planters who get their coolies from India and to throw obstacles in the way of coolies who apply for employment in the country and of planters who engage their labour locally. Now he had always engaged his coolies locally and never had any difficulty in getting all the labour he wanted. It had been suggested that the reason of this was because he was so favourably situated when on the Selangor Estate, but even now they come and offer themselves at Batu Tiga which is out of the way, unhealthy and expensive.

Mr. Prior said he was surprised to hear any member make such a proposal as Mr. Huttenbach had done. The agreement, which had been unanimously passed by a general meeting only a few months ago, was calculated to do a great deal of good and had done good and to ask us to cancel it now was asking us to make fools of ourselves.

Mr. Darby agreed with Mr. Prior that the agreement was much needed and had done good.

Mr. Dougal said they had all heard Mr. Huttenbach say that he got all his labour locally and could always get more than he required and under the circumstances he thought Mr. Huttenbach was very lucky, but in his opinion instead of Mr. Huttenbach making a boast of this, he thought it was a thing he need not be proud of. When coolies know that they will be taken on by an employer if they offer their services

they are only too ready to give in their names, with or without any reasonable excuse and leave the estate.

Mr. Carey said he thought we were inclined to take Mr. Huttenbach too seriously, as he could hardly imagine that Mr. Huttenbach really meant all he had said.

The motion on being put to the meeting was lost, no one voting for it but the proposer.

TELEPHONES.

Mr. Huttenbach proposed and Mr. Prior seconded the following resolution:—"That Government be asked to connect the outstations and various estates in the districts by telephone with Kuala Lumpur."

Carried unanimously.

The next business before the meeting was to elect a member of Committee in place of Mr. Dougal who is shortly leaving the State for the old country.

On a ballot being taken for a representative of the S. P. A. in the U. P. A. Committee, in place of Mr Dougal, Mr. G Shepherd was elected.

AN AUSTRALIAN TEA BUSINESS.

(Special to the Ceylon Observer.)

Sydney, Oct. 1.

Griffiths Brothers are a house hold name in Sydney and district, being one of the largest tea firms in a city, which is conspicuous for stores, selling that popular article of consumption. They have erected handsome premises opposite the Town-hall in George-street, at the top of which is a railway signal, and the trade mark of this firm is seen half-way down the street. The firm believe in advertising and in all parts of Sydney and suburbs placards announcing Griffith's teas and coffees meet the eye, while they have adopted a rather novel method of bringing their name before the public. Near every station on all the railway lines for a good distance from Sydney are placed finger-posts telling the traveller how many miles he has to go before reaching their well-known firm. Their store is a very handsome one, and is made attractive by a number of China and Japan curios, while on the walls are several handsome paintings, giving a very good impression of Ceylon tea estates in the hill districts. The other afternoon a representative of this journal called at Messrs. Griffiths Brothers; and made the acquaintance of Mr. Greenhill, the buyer and taster of the firm, who readily consented to say a little about the tea trade, in which his firm are engaged, which is chiefly to the public, without passing through the hands of agents. They blend Ceylon, China and Indias together, but sell each country's teas separately as well.

Ceylon tea, said Mr. Greenhill, plays a very important part in our business. I suppose on the whole Ceylon takes up a third of the output of our trade. I do not think we exceed that. Some of the finest grades come into this market.

Asked what estates were the favourites he replied hastily, Agra Ouvah and Middleton. St. John's were seldom met with on this market, but "Tymawr" is frequently met with.

Mr. Greenhill complained of the advance in price in the lower grades of Ceylon tea, and said that during the last six months there had been an advance of fully 20 per cent. On the other hand he endorsed what the representative of another firm in this city had said about Ceylon not getting up to the quality it used to. India tea would do very well for blending purposes, and this could be obtained at lower rates. Of course what Tea was used depended on the man, who manipulated the blends.

What is the prospect of Ceylon tea here?—Ceylon tea will go ahead if brought back to the average quality it was three to five years ago, but if not it will go on the wane. China is coming ahead. The average price of Ceylon tea is higher, the quality is lower.

Messrs. Griffith Bros. have branches in Melbourne, Adelaide, Perth and Freemantle as well as the capital of New South Wales. Melbourne, which also supplies Tasmania, is the headquarters of the firm, but Sydney has the largest output.

Our representative had seen in a western paper an advertisement announcing the distribution of tea-seed among farmers, etc., and he asked for a few particulars about it.

Mr. Greenhill said it was a kind of a hobby. Mr. Griffith had got tea to grow pretty well in his garden at Bayswater, just outside Melbourne, and they had sent seeds to some of their clients. They had about 300 applications, but they had had barely time to judge of results. He thought it would never pay to grow tea here on account of labour difficulties. If they had coolie labour they might; but, owing to the objections of the working classes, the various Governments in the colonies refuse to allow alien labour to be introduced. The development of tea takes a number of years, but if the labour difficulty was overcome, and they looked ahead a quarter of a century the chances were a certain amount of tea might be produced in the colony for commercial purposes.

MR. E. E. GREEN "COCCIDAE OF CEYLON."

We have already published several notices of this book, and are glad to find it is still receiving at the hands of the reviewers at home and elsewhere the attention it deserves. The following *critiques* are from two papers of recognised value in scientists' circles:—

(Natural Science, October.)

The Coccidae constitute an aberrant group of the Hemiptera, contradicting all ordinary definitions of the order and class to which they belong. Hemipterous hexapods, yet in the female sex wingless, and in many genera legless as well. The very methods by which they must be studied are peculiar, and as such distasteful to the ordinary entomologist.

So it has happened that these creatures, though numerous and peculiar, have been greatly neglected. But in recent years, as though outraged by such persistent scorn, they have risen in their might and played havoc with our fruit trees and other crops, not to mention ornamental plants; wherefore we have been obliged to recognise their existence.

Studies usually begun with economic ends in view have led us far afield. It becomes plainer every day that the Coccidae are not only extremely numerous in species, but offer an extraordinary series of peculiar forms, whose organisation, as related to their environment and habits, is of the greatest interest from a purely biological standpoint. The opportunity to advance both economic entomology and pure science is too good to be neglected once perceived; and so we find a new body of students arising, calling themselves coccidologists, and dignifying their study by the name of coccidology.

Of these latter-day students assuredly E. Ernest Green is second to none. Beginning his researches during the previous decade he at first proceeded slowly. The literature of the subject was difficult

to obtain, and when obtained threw little light on the almost unknown coccid fauna of Ceylon. But Mr. Green, not discouraged, resolved to study every species *de novo*, whether described or not; acquiring his knowledge first-hand from nature, as though he might be Adam in the Garden of Eden. This method, in the hands of an intelligent worker, is sure to be successful, and it was eminently so in the case of Mr. Green. He not only prepared descriptions, but also elaborate drawings of every species in all its stages, so far as they could be obtained. This done, a thorough examination of the various publications on Coccidae had to be made before the apparently new forms could be reported as such; but this revealed comparatively few identities. In Part I. there are thirty species described, of which seventeen were new; in Part II. are twenty-nine species, all but three discovered by the author. It often happens, on receiving a paper describing so many new species, that one can immediately detect some synonymy; but I do not know of any "bad species" among the forty-three above mentioned, and doubt if there are any. The descriptions are good, and the plates most beautiful. There is an introductory portion on the general principles of coccidology, including a new classification of the sub-families and full directions for collecting and preserving material. There is also a chapter on the insecticides and other means for destroying Coccidae which injure cultivated plants. In the last-mentioned chapter the interesting fact is brought out that practically all the injurious coccids in Ceylon are those described from elsewhere and presumably introduced into the island. The truly native species, almost without exception, have proved to possess no economic importance; though of course these very species, *carried somewhere else*, may yet become notorious.

An unfortunate conservation, as it seems to the present writer, is shown in regard to genera. The species assigned to *Aspidiotus* represent at least five very distinct groups, which are at least of subgeneric value. *Aonidia* is made to include very diverse forms, including three distinct generic types. Similarly the twenty-six species assigned to *Chionaspis* are by no means truly congeneric; for instance the first six, *aspidistrae*, *theae*, *albizziae*, *mussaendae*, *rhododendri*, and *scrobicularum*, belong properly to *Hemichionaspis*. The generic classification of the Coccidae, however, is at present in a transitional state, and an author cannot be blamed if he hesitates to propose changes while yet uncertain what those changes should be.

Simply as an illustration of good methods this work ought to be examined by zoologists who do not expect to study Coccidae; while for the coccidologist it is of course essential. Under these circumstances it is to be regretted that the manner of publication is such as to make it extremely costly. The only edition has coloured plates, which of course are expensive, while the colouring does not greatly add to their value for scientific purposes. It would have been excellent to have a coloured edition of small size, if there could have been an uncoloured one at a more moderate price. But the chief trouble is that the publishers insist upon receiving the full subscription (£5) for the work in advance, though it must take at least several years to complete it. The work, of course, is intrinsically worth all that is asked for it, and more; but the fact remains that zoologists are not commonly blessed with superabundant means, and are reluctant to part with a five-pound note under the circumstances just mentioned. Surely if the conditions of sale were rendered easier the subscriptions would become so much more numerous that the amount received would be considerably greater than at present. T. D. A. Cockerell.

(*Entomologist's Monthly Magazine*, October.)

The Coccidæ of Ceylon: by E. Ernest Green, F.E.S. Part i, pp. i—xii and 1—103, with 33 plates (1896); Part ii, pp. xiii—xli and 104—169, with 30 plates (1896). London: Dulau and Co.

It is now somewhat over thirty years since Signoret commenced his "Essai sur les Cochenilles," in which de demonstrated by pen and pencil that these to many easy very unattractive insects, the females of most of which live under a sort of fixed carapace (the "scale") for most of their lives, possessed, when examined microscopically, beautiful structure, and that the outline of the pygidium, with its curious denticulations (together with the spinnerets, &c.), furnished valuable generic and specific characters. For many years Signoret found few disciples, and died before the full effects of his work manifested themselves. We think we may fairly claim that to our venerable colleague Mr. Douglas (now in his 85th year) by his papers in this Magazine, was due the initial movement that has since spread over the whole world by leaps and bounds, and has in several instances (such as *Icerya Purchasi* and *Aspidiotus perniciosus*) occasioned government solicitude, and the establishment of paid official entomologists, whose duty largely it is to look after these apparently insignificant scale-bugs. There are at the present time many workers in this field, and their publications are distributed over nearly every medium, and must number thousands of pages annually, whereas about thirty years ago there was nothing. Prominent amongst the workers at the present day is Mr. Ernest Green, the author of the book now under notice. Members of Mr. Green's family have long been associated with Ceylon, and have also been known as entomologists: they saw the ruin of the coffee-trade in the island (by a fungus), and the substitution of tea-planting; it was but natural that our author, as an entomologist, and with a knowledge of the disastrous results of the ravages of *Coccidæ* in other parts of the world, should have watched with much care their effects on the tea-plants, and in so doing his attention has been directed to the group as a whole. Mr. Green, at the solicitation of the Planters' Association, while retaining his interest in his former occupation, consented to devote himself entirely to watching the insect enemies of the planter, and to devising and testing remedies. In addition to his acquirements as an entomologist, Mr. Green possesses the art of delineating (mostly from microscopical specimens) insects and dissections of insects in an exquisitely delicate manner, and one need only glance over the numerous plates in the book before us to see that the work is that of a master hand, incapable, we might venture to say, of being surpassed, and the figures have been faithfully reproduced by chromo-lithography (most unfortunately the paper for the plates is of a smaller size than the text). The letter-press is of the fullest possible nature, with (in Part i) a concise summary of the general habits and structure of the group. The generic and specific details are complete, and the tables of genera are made to include those not yet found in the island. Mr. Green estimates that about 200 species inhabit Ceylon, many are apparently endemic, others again are cosmopolitan or introduced. Much interesting detail is given on the natural insect enemies of *Coccidæ*, and it was news to us that the larvæ of one of the *Lycænidæ* (*Spalgis Epius*, Westw.) feed entirely on "mealy bug."

To Part ii is appended a long chapter on remedial measures and insecticides. It is acknowledged that this is largely drawn from American sources, and the author hopes that amongst the remedies some may be found suitable for application in Ceylon should occasion require. Much stress is laid upon the necessity for quarantine, and in this connection it is stated that all the species that have proved noxious in the island have either been certainly imported or are of general distribution. No undoubtedly endemic species has caused any anxiety. Did space permit we would touch upon some curiosities of *Coccid* life in the work before us. Without doubt it is the most important work that has yet appeared on the subject; it is not often one finds scientific attainments and iconographic skill of the highest

order so happily combined. Putting on one side the matters of labour and time, the cost of producing such a work is great. It is not too much to ask that naturalists who can afford to subscribe to it will do so, and public libraries should possess it.—R. McL.

THE FUTURE OF THE CEYLON TEA INDUSTRY.

London, Oct. 6.

I have had the opportunity of discussing this all-important question during the present week with several representative authorities, all more or less interested in the welfare of our staple industry and the important trade based upon it. I will mention no names, because I have not yet completed my circle of enquiry and observation. But I may at once give you a resumé of the information so far placed at my disposal and of the conclusions I have attempted to deduce. And first, it is cheering to remark on the general confidence maintained in the future of Ceylon and its "tea." The check given to over-production by the enhanced rupee, and the recent fair supply of labour have undoubtedly strengthened the position; while the disastrous experiences in Darjiling, affecting not a few well-known "gardens," has once more attracted attention to the wonderful exemption of the planting districts of Ceylon from earthquake, cyclone or hurricane and so far tended to enhance the estimation of

PLANTATION PROPERTY IN OUR ISLAND.

On the other hand, I find myself always asked "What about these

BLIGHTS,

of which we hear so much in the papers and in correspondence of late?" Now my reply has been uniformly and honestly reassuring; for I firmly believe that, while there was occasion at first to rouse the attention of planters in certain districts to the need of "watching and working" towards checking the evil, and while I felt strongly that both Mr. Willis and Mr. Carruthers took too light-hearted a view in what was no doubt a preliminary (as well as inadequate) Report; yet, during the present year, planters, it seems to me, have rushed to the other extreme and are making too much of the "blight" enemies with which tea has to cope at certain times and in certain districts. I have had placed before me reliable evidence that not a few are inclined to attribute to "blight," injuries or discoloration of their tea-bush leaves, due to the puncturing of insects, to climatic, local and temporary causes. Just as some men at the outset refused to recognise the presence of the grey blight, even when pointed out to them,—so, of late, the other extreme is seen in many superintendents discovering blight in every trivial attack of minor enemies from which no product is free. I do not for a moment say that there are not, in some parts of Ceylon, attacks—and serious attacks—of what Dr. Watt points out to be the worst enemy of our brethren in Assam; but I do maintain that they are far less widespread than has been recently supposed; that they are often very temporary and due to causes (such as too long delay in pruning) easily overcome; and that the time has come now for planters to be very careful in their observations and cautiots in reporting "blight", before they are fully convinced that the real "Simon Pure" is amongst them. Even then, of course, the fight, which can be made in defending and clearing so hardy a bush as tea, is very satisfactory as compared with any other sub-tropical product with which we are acquainted.

All this, however, only shows the importance of

A CRYPTOGAMIST OR MYCOLOGIST

being at work among the Ceylon planting districts; and it is satisfactory to know that the authorities are fully alive to this fact. Negatively, in showing where there is no blight, his work may be nearly as important as positively in experimenting where blights exist and in writing out the life-history and practical remedies for such evils. With, in addition, the presence of an Entomologist, in the person of one so specially qualified as

MR. E. E. GREEN

—himself a practical planter—and the prolonged engagement of

MR. KELWAY BAMBER

as Chemical Analyst and general adviser, surely the Ceylon tea planter may look the whole world in the face, and more especially the commercial (capitalist) world of London, and maintain that everything possible is being done to maintain the industry and the value of properties in the Colony itself—a colony, moreover, where there are the greatest possible conveniences for thorough examination and careful experiments—Ceylon in this respect beating both Java and Northern India with their far more scattered and diverse planting interests.

The next division of my subject for the present, should be the continued progress made in opening

NEW MARKETS

and in this connection I am pleased to read Mr. Renton's encouraging *ad interim* report; and no less to remark on the important fact brought out by your Hewaheta correspondent, that coffee, even at its present unprecedentedly low price, is by no means so economic a drink as tea, if the test be the quantity of enjoyable, or average beverage got from the same weight of each product. Discussing this point with a tea merchant in the City interested in the American market, he pointed out that good coffee could be sold in the United States at one-fourth to one-fifth the price of good tea (in view of the duty on the latter and other causes); but I at once replied that, even taking this somewhat extreme comparison, tea gave *eight* times the return that, coffee did, in a reliable refreshing beverage! This fact must be pressed home on practical Americans as well as on all careful housekeepers on the Continent of Europe (where their name is legion,) and I am sorry I did not embody it in my little French slip of instructions printed at Vichy, in addition to the note I gave on the greater economy of using Ceylon, rather than China,

tea. This latter fact arrested the attention at once, of quite a number to whom the circular was given at Vichy and in Paris; and no less during the late B. A. Excursion in Northern France and Belgium. I am convinced that by means of useful literature, popularly distributed, and judicious advertising, great progress can be rapidly made in winning the Continent of Europe for Ceylon tea, the proximity of the Colombo market to Odessa, Trieste, Genoa, Marseilles as well as Antwerp and Hamburg being another great advantage, when once a direct trade is fully developed.

But now I come to another phase of my subject and one which is, perhaps, of more immediate interest in tea circles in London at present. I refer to the arrangements connected with the receipt, handling and selling of our staple product in this,

THE GREATEST TEA MART IN THE WORLD.

The agitation over the one-pound draft, although it may be thought by many to have ended abortively, and even disastrously, for the time. has undoubtedly resulted in one great good, by bringing a full light of enquiry and criticism to bear on all the arrangements connected with the importation and selling of tea, and some of the details, I find, were quite unknown to men of not a little experience in the trade. I have not yet seen my friend, Mr. Brooke, the well-known, experienced, practical head of Messrs. J. A Hadden & Co.; but I am assured that the system which he induced the Customs to sanction (and which he brought out so fully in his letter of protest) was quite unknown to most of his brethren, or some of them would not have proposed a change equivalent to, perhaps, four-pence a chest, in the weighing, at the risk of incurring a charge of five-pence for taring the same chest! The whole question of warehouse arrangements is now under the careful consideration of the joint Committee of Indian and Ceylon Tea representatives (they held a meeting yesterday) and not a little novel information is likely to be obtained as to the process attending "overtakers,"—surplus tea not put back in chests—*not*, as always supposed, because of careless repacking preventing its admission, but under a regularly adopted system which must have been worked to the great advantage of some unknown parties, neither planters nor merchants. Then, again, the strange fact is likely to be brought out that certain Indian Tea Companies, having protested, and insisted on a strict account of all their tea, have not suffered, like the bulk of their brethren, from this "overtaking" arrangement! Clearly there is great room for reform and for putting all the warehousing, weighing gross and tare, bulking and repacking arrangements, on a consistent, equitable and economic footing, and I trust this may be the final outcome of the present inquiry.

But now I come to an aspect of my subject which has been discussed freely in my presence, *pro et con*, by brokers and merchants during the present week and regarding which I may send you more information by another mail. Every change and reform has the object of "economy" more or less in need, and it may be permitted here to offer a few general remarks on this aspect of the question. The position of the tea-growing industry has, during the past two or three years, necessitated the exercise of strict "economy" in all matters of expenditure, but the equally important question of

"MARKETING THE PRODUCE"

to the best possible advantage, has received but little, if any, general attention. The very considerable decline in values, as compared with, say, ten years ago, is doubtless mainly due to increased production. This increase was induced by the steady fall in the sterling value of the rupee; and so long as the fall continued, it compensated growers for the lower range of values established. But it would be well for producers to consider what other influences may have contributed to this lowering of values. The practice of putting up to public auction all Indian and Ceylon teas as fast as they arrive, regardless of the immediate requirements of the trade, has undoubtedly (in the opinion of good authorities) had, very frequently, a depressing effect on prices from which recovery has been extremely slow. This it is now sought to overcome by the formation of a Committee to regulate the offerings of Indian teas, which certainly is a step in the right direction; but unless the members of the Regulating Committee are able to gauge fairly closely the extent of the current consumption of the article, and unless the whole of the Indian importers consistently back up the Regulating Committee, it is to be feared that the movement may not prove as full and complete a remedy as is desirable. It is pointed out to me that, during the past ten or twenty years, very important changes have occurred in the methods of the

HOME DISTRIBUTING TRADE.

Formerly, I am told, when the China leaf held the market, the dealer was practically the only purchaser for the home trade, the "Blender to the Trade" being unknown. And it is of importance to bear in mind that nearly the whole of the China tea sold in the London market passed by "*private contract*"—very little, and that only to close up shipments, etc., being offered at auction. The dealers in those days carried very considerable stocks; and as they were able to obtain reasonable profits on the basis of Mincing Lane quotations, they had no inducement to lower market values. With the present-day wholesale blender and packet man the case is quite different. He has his standard blends, with fixed prices so far as his customers are concerned; and inasmuch as his purchases at auction cannot be followed, as can those of the dealer by his grocer clients, his profit is the greater the more he can knock down Mincing Lane values. We have also, apparently, to accept the fact that the blender and packet man have been eminently successful in cutting into the trade of the old-time dealer and family grocer, for whom the grower may be excused for having as great a reverence as has the modern buyer for the old-established "pound draft!" It must not be imagined that, to start as a "blender to the trade" or as proprietor of a "packet," is necessarily equivalent to banking a fortune. Many have

failed where few have succeeded, and the latter doubtless owe their success to exceptional business capacity and enterprise, for which all credit is due to them. The fact, however, remains that the London Tea Market is dominated by a few,—a comparatively very few,—large wholesale blenders. There are, of course, numerous other buyers, for the trade of the dealer has not yet been completely wiped out; but the possible operations of these few very large buyers is an additional and hampering element which all others have to take into consideration. The great influence on the market of the large buyers is also felt by sellers of Calcutta or Colombo-bought teas, as also, it is asserted in nine cases out of ten, by growers who do not accept the best bid at auction, and who "take out" any break. The general policy, it is alleged, is, as far as possible, to render the character of the auctions "without reserve" sales, and to discourage all teas not put up on growers' account, presumably because a grower is more squeezable than an importer who has a merchant's cost to cover and profit to fight for. The essence of public auction, of course, is that there should be free and unrestricted competition for the article exposed for sale; and anyone with any knowledge of the subject, I am assured in some quarters, can hardly contend that these conditions apply to the tea auctions in Mincing Lane, except on the rare occasions when any particular grade of tea may be in very short supply.

That the conditions obtaining in the London market are felt to be unsatisfactory seems to be proved by the suggestions which have from time to time been put forward by producers. It has been proposed many times that growers should combine to distribute the produce themselves; but presumably such proposals have been made without consideration as to the enormous extent of the trade, and of the very large capital and personal which would be necessary. The first desideratum, however, would be a complete combination of growers, which would practically amount to a "pooling" of the produce. If this could be secured, there would be no object in going much further, for the existing distributing companies and firms would be available as a means of distribution, and that on very reasonable terms, even on the basis of their present profits, taking them all round.

Another suggestion is that in place of sending all teas to London several other centres should be fixed on, such as Manchester, Glasgow, Leeds, etc. Assuming, however, that the initial difficulty could be overcome of sending to each centre exactly the class of tea required for the districts it would serve, the competition would be less than it is at present; for, although all the very large buyers might be represented, only a proportion of the smaller ones could be expected to attend the sales at each centre.

The great obstacle in the way of reverting to the system of "private contract" is the large number of breaks now put on the market. To some extent this might be improved upon without much trouble on the estates, but not to the extent necessary to admit of the change indicated, unless the whole system of packing teas for the London market be revised. Breaks of *at least* 200 to 300 chests, *i.e.* of each *grade* of tea, would have to be the *general rule*, and the larger the break the better—especially of the principal grades which might run up to 500 or 600 chests. Such breaks could only be secured by bulking together teas of the same character from different estates, and this could only be undertaken by large companies or combinations of proprietors. Such a change would be very difficult of arrangement, except perhaps gradually.

So long as sales by public auction cannot be avoided, it is undoubtedly to the seller's advantage to place his teas on the market where they are most likely to meet with the greatest competition, and the Calcutta and Colombo markets would seem to answer this requirement. Several of the large London buyers have representatives on these markets, and in addition there are buyers for direct shipment to Australia, America, Russia and other parts of the world; while there are also merchants operating for the Mincing Lane market. But it is pointed out these latter are at present at considerable disadvantage owing to the action of the large buyers in London. It is, however, not going too far to say that, if the whole of the Indian and Ceylon crops were respectively sold in Calcutta and Colombo, the competition of merchants prepared to take merchants' risks would be a most important factor in counteracting the overweighting influence of the large London buyers, and that the London stocks of tea, not in grower's hands, would be very much more generally held, which could not fail to have an advantageous effect on prices.

As a means, therefore, of improving the grower's position in the matter of marketing their produce, it is now suggested for consideration:—(1) that a more extended use be made of the Calcutta and Colombo markets, especially by gardens unable to pack large breaks; and (2) that for London very large breaks should be made up wherever possible, and be placed on the market for sale by *private contract*. The excessive cost of working teas in the London warehouses is now (as I have already said) engaging the attention of importers, and doubtless this matter will be dealt with earnestly at an early date, when the charge for bulking will receive attention. With an appreciable reduction under this head, it would be easier, both for the large plantation companies and for import merchants, to bulk together teas from different gardens, and so appreciably diminish the number of breaks. The grower is, of course, entirely free to select his own market; but there are two parties to a contract of sale, whether it be public sale or private contract. It is hinted, however, that certain of the buyers would probably prefer to see private contract the customary condition; but in any case that it would not be introducing a radical change, as the bulk of China teas are still sold privately and private contracts of Indian and Ceylon are not unknown.

With an overstocked market the seller is at a disadvantage in endeavouring to make his voice heard. There are indications that the demand for British-grown teas is approaching the supply more nearly than has been the case for some years, and, therefore,

I am told, it would be well for producers to endeavour at such a time to put matters on a sound footing even though there may be less immediate necessity for doing so than has lately been the case. On the other hand, I have had grave doubts expressed to me as to the principle and practice of "private contracts" being advantageous to the producers. It is asserted by not a few, that there is nothing like open competition to determine values and secure fair prices; that private offers and contracts induce suspicion and jealousy; and that prices must always in the long run be governed by the laws of supply and demand. Still it is admitted, even by the strongest opponents of a change, that private contracts are useful and feasible even now in certain cases; that is, when a dealer, having bought an invoice, is offered and agrees to take two or three more invoices of the same tea—not as yet put in auction—at the same prices as the invoice offered in sale. With this exposition of both sides of the question, I must now leave the matter for the consideration of the tea planters and merchants of Ceylon, assured that, if a change is desirable, it will find advocates amongst their number, ready to do what they can to improve the present condition of affairs.

THE IMPROVEMENT OF COFFEE—II.

(*By a Planter.*)

There can be little doubt that the quality of coffee must be put into the bean on the tree, before it can be developed by the very best method of curing. The most important quality is the flavour when roasted, and coffee bought for the Home trade is always tested by roasting. For the Continent, coffee is chiefly bought on its appearance, it being presumed that boldness and evenness combined with colour ensure a good flavour. As regrads East India coffee, it is certainly the case that no coffee that does not combine all these qualities can be expected to realise a high price, either for the Home, or export trades. The flavour of coffee depends entirely on soil, climate, and species. All East Indian Arabica, Mecha, and most Central American coffees rank as mild coffees, while all Brazilian and Liberian coffees rank as rough coffees English Companies have recently introduced Indian methods of pulping and washing into Santos, and claim to have increased the price some 4*s* a cwt. This leaves it, however, at 30*s* a cwt. agiust 52*s*. for middling East India, in the first half of this year. We may conclude, therefore, that something in the climate of, or in the variety of plant cultivated in, Brazil produces a distinct flavour which, fortunately for us, is considered decidedly inferior to the coffee we produce. Further, within India itself, as is the case with wine in France and Germany, the produce of certain Districts and Estates is decidedly superior to that of others. As regards the Disrict, this superiority is probably due to the dryness of the climate and the elevation above sea level, while in the case of the Estate it must be due to soil. In both cases, probably, some of the superiority is due to the variety of plant cultivated. Admitting that the improvement of the produce of any particular Estate or District is limited by the above conditons, it remains to be seen what can be done to obtain the greatest improvement possible in the produce of any given Estate or District.

It will be generally allowed that the quality of the bean in a crop of any size depends on the vigour of the tree, and that careful handling and pruning to keep the tree open, and thorough cultivation to keep the soil sweet, are essential oonditions of such vigour. For the latter purpose drains, 1 feet deep by 1 foot wide and 10 feet aprt are preferable to digging the soil, as it is found that too frequent digging interferes with the roots too much. The Wynaad Committee of 1885 found that shade improved the colour of coffee, and shade is now almost universal, though it was introduced chifly to ward off attacks of borer and leaf disease Lastly, the use of manure is also almost universal now; but, when we come to consider the effect of manure on the quality of the bean, we enter on a very difficult question. For there are two very disturbing factors in calculating the effect of manures: firstly, the law that the larger the crop the worse as a rule is the quality of the beau; and secondly the variation of the season, which may cause a detrioration in the bean in spite of every care bestowed on the cultivation of the tree. The following results obtained by the Wynaad Committee in 1885 seem to show that the price depends entirely on the size of the crop, and not on the manure used:—

Sample.	How manure.	Crop cwts. per acre.	Leaf disease	Price per cwt. for A. coffee s.	s.
No. 1	Young coffee never manured	4	Little or none	61/	
No. 2	Cattle manure once in 2 years	$5\frac{1}{4}$	Severe in parts	50	
No. 3	Bones and poonac once in 3 Years	$5\frac{3}{4}$	Severe	56/	
No. 4	Manure yearly $\frac{1}{2}$ cattle; $\frac{1}{2}$ bones and poonac	$3\frac{1}{4}$	Severe	69/6	
No. 5	Once in 2 year best cattle; best artificial	$3\frac{1}{2}$	Slight	56/	
No. 6	Small part cattle manure yearly	$2\frac{1}{4}$	Very mild	64/	65/
No. 7	Once in 3 years chiefly artificial	3	Mild	56/6	
No. 8	Highly with cattle and artificial	7	S	57/6	

An Agent wrote to the Committee:—"I have already got prices for a good number of Estates, and it is very curious how they vary, and still more curious how the coffee from well cultivated Estates has fetched a much lower price than crops from poor semi-abandoned ones." The explanation of this also is, probably, that the crop from the semi-abandoned was much smaller than from the well cultivated Estates. Recently complaints have been made as to the poor quality of crops from Estates on the Nilgiris and Shevaroys, heavily manured with chemical manures. The deterioration is more probably due to the heaviness of the crops, and to excessive drought, than to the use of chemical manures. A dry climate favours a good bean, but there must be enough moisture during the formation of the berry to develop it properly. Possibly the application of too much nitrogen, and of phosphates in a form which the tree cannot readily assimilate may have had something to do with the deterioration —for the former manure might force a heavy crop unsupported by the letter. The writer's experience is that a steady application of steamed bone-dust, combined with the proper proportion of nitrogen in poonac or cattle manure, does undoubtedly improve both the quantity and quality of the crop over a series of years; and that purely chemical manures do not support the tree under a heavy crop as manures of organic origin do. Some of the most successful Estates in Mysore and Coorg rely chiefly on manures of organic origin. The main point to attend to is to promote the vigour of the tree by the use of suitable phosphates with the proper proportion of nitrogen to make the phosphates most efficacious, and not to force on the tree a heavier crop than it can mature properly. The Wynaad Committee concluded that, though it cannot be said that maunres affect the colour of the bean directly, there can be no doubt that high cultivation improves the boldness and weight of the bean, These agian are intimately connected with colour, and in

this way manures seem essential to obtaining and maintaining colour in the bean. The Committee admitted, however, that colour depends in a great measure on climatic influences, which vary from year to year, and on the lightness of the crop. Another 13 years of leaf disease have convinced most planters of the necessity of regular manuring, and also of following Mr. Elliot's advice of concentrating high cultivation on the best fields. That policy has, however, been in full swing ever since the crisis of 1882-85, and has been supplemented by planters putting their inferior lands under cinchona, pepper, and tea. These, though not exactly methods of improving coffee, are very efficient methods of improving the coffee planter's finances when one of the crises, to which coffee is periodically liable, occur.

There is yet another way in which planters may try to prromote the vigour of the coffee tree, on which the quality of the bean so largely depends. This is by the introduction of new varieties of coffee, either by importation from other countries, or by the selection of pedigree seed, or by hybridisation. The first has been freely tried without any benefit, except in one instauce, that of Nalknaad coffee seed. Attention has been drawn to the marvellous results obtained in wheat and cotton by the cultivation of pedigree seed, *i. e.*, sowing seed only from exceptionally vigorous and heavy cropping plants, and again taking seed only from the most vigorous progeny, till after several generations an entirely new, hardy and heavy cropping variety is established. But sufficient attention has not been paid to the fact that, though it is easy in the case of annuals to grow rapidly enormous numbers of successive generations from which to make the necessary selections to establish new varieties, it would entail a very heavy expense over a long series of years to do this in the case of a plant like coffee, which takes three years to come into bearing and seven years to reach maturity, and requires virgin land if it is to be grown successfully on a large scale. In America, or in the British or Dutch Colonies, large or small, this would be done by State officials; but the Government of India has not yet learnt the importance of liberal scientific aid to agriculture, although India is more dependent than almost any other country on that industry for its revenues. The same is true of hybridisation, but fortunately it has chanced that individuals have already obtained results in this line, though more by good luck than anything else. It will, of course, take some time to establish by careful selection a fixed variety; but the following results, reported at the Conference of hybridisation experts held at Chiswick inJuly last, are full of encouragement for planters in dealing with hybrid coffee. It was stated that varities are perpetuated in crossing, and not as a matter of fact obliterated; that, although in the first or second generation nothing new may be seen in some cases, yet often in the third and fourth generation 58 and 75 to 80 per cent. of the variety desired may be obtained that hybrids are not as a rule infertile and, when they are, it is due to some special circumstance.

In this connection it would be well if coffee planters followed the example of their tea brethren, and tested the results of their experiments in the cup. For, though the grocer buys largely by appearance and even values his coffee by the even appearance of the roasted bean, yet there are not wanting men who are pointing out that the surest way to promote their business is to buy entirely on the flavour of the roasted bean, and who are urging grocers to disregard appearance when the flavour of the roast is good. If this method of valuing coffee becomes universal—and it is said to be the coming revolution in the coffee trade—we shall hear less of the superior appearance and evenness of Central American coffee, and, provided our coffees hold their own for flavour, we need not fear a little unevenness or even lack of colour—such, for instance, as is common in Mocha coffee.—*Madras Mail.*

INDIAN AND CEYLON TEAS.

SECOND ARTICLE.

A fortnight ago we published an article dealing with the progress made by British-grown teas in the regard of the tea-drinkers of the world; we now turn out attention to the working of tea companies in the year 1898-9.

First, we will briefly survey the Indian Companies. Last year the lot of tea growers in India was not a happy one. Exchange remained consistently high, 1s 3½d to 1s 4d being the average figure. Freight was also an expensive item, of which the chairmen of tea companies, with one accord, have complained to the sympathetic shareholders at the meetings held during the past few months. Then, again, the crop in India did not realise the anticipations of planters, who had computed the yield at about 158 million pounds. As time went on it was seen that this figure would not be reached. Unpropitious weather was experienced in some districts, and, as a matter of fact, the actual crop was 153 million pounds, of which about 135 millions came to this country. The Cachar and Sylhet gardens suffered severely from drought, and their tea was poor, realising not more than 6d per lb. on an average. Assam, Darjeeling, and Dooars teas, on the other hand, were of pretty good quality, and realised satisfactory prices.

The total paid-up capital of 31 companies is £4,487,308, and the total profit £281,589, an average of 6,275 per cent., which is a sufficiently satisfactory result, all things considered. The average profit per acre of mature plant works out at close upon £2 18s.

Turning now to Ceylon, we give a table showing the dividends paid in 1898 by fifteen representative Companies, as compared with the dividends for 1897.

Company.	Paid up Capital. Preference.		Ord.	Dividends on ordinary Shares. 1897	1898
	£	%	£	%	%
Alliance ..			65,260	6	7
Burnside ..			17,600	7	2
Ceylon Proprietary ..	26,127	5	78,380	5	4
Ceylou Tea Plantation	81,080	7	167,380	15	15
Eastern Produce & Est.	753	5	299,135	7	7
Galaha ..	60,000	6	50,000	2	4
Imperial ..			90,000	4	4
Kelani Valley ..			18,765	10	5
Nuwara Eliya ..			200,000	6	6
Penawal ..	5,300	7	17,000	2	4
Portmore ..			40,000	12	12
Scottish Ceylon ..	9,000	7	41,000	10	10
Standard ..			59,500	15	15
Sunnygama ..	15,000	6	50,000	6	3
Yatiyantota ..	45,000	6	90,000	2	4

The dividends paid on ordinary shares, it will be noticed, were lower in 1898 than in 1897, for the most part. In Ceylon, as in India, the effects of high exchange were felt, and freights to the home market were rather high, although in this respect competition at Colombo places Ceylon in a better position than Calcutta. The crop was below estimates, and the quality was only fair. There was not much development work done by British tea companies. In Ceylon, there is not much room for the extension of plantations; most of the land has been planted, and the Government has practically ceased to lease out land. Some of the existing companies have a little land not yet under tea, but the acreage is small and we may take it that the rapid increase in production which has taken place during the last decade will almost cease. The output of Ceylon tea is about at high water mark. In India there is, of course, abundance of land ready for planting; the great difficulty there is the supply of labour, which, it may be said *en passant*, is the reason why tea-planting in Fiji, where has climate and soil are specially favourable, the never been successful,

The prospects for the current season in both India and Ceylon are very promising. As regards crop, quality, and price they are better than the last two years. In fact, 1898 may be set up as an example of a bad year, when adverse circumstances reached a climax—over-production, lack of labour, and low prices combined against the planter. It may be safely anticipated, therefore, that an improvement will be manifest in the immediate future, although he would be a rash man who would prophesy that never will such another season as that of 1898 be known. Too much importance must not be attached to the earthquake which has been reported from India. First impressions of a disaster of this kind are generally exaggerated. The earthquake had only affected a very limited area—a few gardens in Darjeeling—and the effect upon the total Indian crop will be exceedingly slight.

The tea industry is in a healthier condition at this moment than it has been for several years—healthier, indeed, than it was three years ago, investors were rushing at every tea share they could get. Tea companies have gone through the refining fire of adversity, and have learned much from the experience. Profits are more carefully dealt with; development and extension are not undertaken lightly, but with caution and prudence. The fear of over production has no solid foundation, for on the Continent of Europe, in America, in Australia, and in South Africa, there are markets for practically limitless quantities of British tea, requiring only energetic and untiring work. In tea companies, we are convinced, may be found safe and profitable investments, but investors must, in these, as in all securities, exercise much caution. Entirely new gardens should be shunned, for five or six years must elapse, under the best circumstances, before paying returns can be made. But to well-established going concerns, with reserve estates, attention may, with advantage, be turned.—*Investors' Guardian*, Oct. 7.

CEYLON TEA.

The following advertisement appears in the New York *Evening Post* of Sept. 28:—

THANKS TO HEALTH AND ENERGY RESTORED BY THE USE OF

CEYLON TEA

PRESENTED TO THE SHIP AT COLOMBO, OUR GREAT ADMIRAL ARRIVED TWO DAYS AHEAD OF TIME. IF YOU FEEL SLOW, TRY A CUP OF THIS

PURE, MACHINE-MADE TEA.

PRODUCE AND PLANTING.

The Geographical Distribution of the Tea Plant.—At the International Geographical Congress recently held at Berlin, Mr. J. M'Ewan read a paper on the geographical distribution of the tea plant. The subject should be popular among tea-drinkers in all countries, and the paper will doubtless be read with interest when it makes its appearance in three languages in the official report of the Congress. It is a curious and interesting fact that almost the entire production of tea is raised within an area confined by 40 degrees of latitude and 50 degrees of longitude, and it is no less remarkable that the consumption shows itself to have strictly geographical limitations. Outside of the domestic consumption of China and Japan, regarding which no reliable statistics can be obtained, the principal tea-drinkers, according to Mr. M'Ewan's researches, are the people of Great Britain, Ireland, and of the British colonies, the people of the United States and those of Russia.

Russia and Chinese Tea.—It is a difficult matter to change the taste of a nation even in regard to tea. Although Indian and Ceylon growers have made strenuous efforts to gain a market in Russia, prejudice in favour of Chinese tea is their strongest enemy. The Russian scoffs at innovation, and believes firmly in the tea which comes from China overland. Although in recent years much of the tea consumed in Russia has made the sea voyage from Chinese ports to Odessa on the Black Sea, Russians maintain that tea transported by sea loses much in flavour and quality. In consequence of this the largest tea merchants still continue to receive the bulk of their stock by the overland route. Early in January the caravans arrive in Tomsk. Between the first and the twentieth of the month 19,000 sledges full of tea are expected, each sledge containing five packages of about 130 lb. each. The tea is packed not in cases but in stiffened oxhides. Five sledges are tied together and drawn by one horse. The last sledge of each group contains hay and barley, which the horse of the next group quietly munches as he travels. In consequence of this arrangement the caravans lose no time. From the Chinese tea-growing districts to Tomsk is a year's journey by caravan.

Planting in Fiji.—The Fiji Blue-Book for the past year is a record of great prosperity. The revenue was £94,164, or nearly £20,000 more than that of the previous year—on account mainly of a large increase in the Customs revenue—while the expenditure was £72,574, or, including extraordinary public works and a sum put aside for public works during the current year, £87,594. The great increase in the Customs revenue is largely due to a new tariff which came into force during last year, but also in part to an increase in trade. The tariff, which was 10 per cent. *ad valorem* on certain articles, is now 12½, and certain duty-free articles have become dutiable. The imports consist mainly of food-stuffs, clothing, hardware, and machinery, while the exports are sugar (about two-thirds of the whole), copra, and green fruit. The two latter will probably increase in the future, as large areas have been planted by the natives with fruit and coconuts. The population at the end of the year was estimated at 121,738, of which 3,927 were Europeans, 12,320 natives of India, and over 98,000 Fijians. The death-rate amongst Europeans is exceptionally low, the colony possessing "probably the most healthy tropical climate in the world." Beyond the municipal boundaries of Suva and Levuka there are few roads fit for wheeled traffic, though there are bridle paths everywhere. A properly metalled road from Suva to Rewa, thirteen miles, has been commenced, but communication almost everywhere is by water, and this has lately been much increased and improved. There is room for considerable extension in the cultivation of such products as coffee, cocoa, vanilla, limes, ginger, &c., a market for all these existing in Australia, and the Assistant-Colonial Secretary says there is an opening in this direction in the colony for persons with the necessary experience in tropical agriculture and a certain amount of capital.

Planting on the Gold Coast.—Planting operations on the Gold Coast receive useful encouragement from the Government. In the agricultural district, says a newly issued colonial report, the planters take the cocoa and coffee to the Government botanical station, where the Government pays them half the supposed market value of the products, less a small sum to cover freight and other charges. The cocoa and coffee are then sent home, and when sold the balance of the money is paid to the producers. In this way not only do the planters receive full value for their articles, but they get enough money on the first sale to Government to enable them to continue their work, and they are therefore not compelled to sell to shippers on the coast at a low price or await the return of their money from the bankers in England. This is a plan that might be imitated elsewhere.—*Home and Colonial Mail*, Oct. 13.

CHINA TEA.

EXPORT OF TEA FROM CHINA TO UNITED KINGDOM AND CONTINENT.

1899-1900.	1898-99.
lb.	lb.
24,313,161	24,299,525

EXPORT OF TEA FROM CHINA TO UNITED STATES AND CANADA.

1899-1900.	1898-99.
lb.	lb.
12,317,295	11,512,564

EXPORT OF TEA FROM CHINA TO ODESSA.

	1899-1900.	1898-99,
	lb.	lb.
Shanghai and Hankow	25,363,948	22,676,902

EXPORT OF TEA FROM JAPAN TO UNITED STATES AND CANADA.

1899-1900.	1898-99.
lb.	lb.
31,351,095	29,456,836

—*Hongkong Weekly Press*, Oct. 14.

KORALE TEA ESTATES, LTD.

The following is from the report of the directors, to be submitted at the third annual ordinary general meeting of shareholders, to be held at the office of the company on Thursday, Oct. 19th.

The directors now submit the report and accounts for the year ending June 30th, 1898, which have been duly audited. The net amount at credit of profit and loss account after providing for general expense is £2,494 15s 1d. To which should be added the balance brought forward from June 30th, 1898, £218 16s 10d; to dispose of which it is proposed to pay a dividend of five per cent, which will absorb £2,394 5s; directors' fees, £150; and to carry forward a balance of £169 6s 11d. In presenting the third annual report, the directors have pleasure in pointing out to the shareholders that though the expectations held out on the formation of the company have not yet been fully realised, the position of the company has improved, the net profit from the estates this year being £870 in excess of last year. Though the rates of freight and exchange have ruled higher than in the previous year there has been no loss on rice, and partly owing to improvement in manufacture and partly to the healthier state of the tea market, better average prices have been secured for the tea from all the estates than in the previous year. Mr. R C Haldane having retired from business and ceased to live near London, Mr. H C Dowling has been appointed secretary. Mr. W S Bennet retires from the board in accordance with the Articles of Association, and being eligible, offers himself for re-election. The directors continue to adopt the policy of working the estates as economically as is consistent with good cultivation, and to increase the value of their properties by planting up more of their reserve land, and when the 300 acres not yet in bearing reach maturity they confidently expect that the position of the shareholders will be much improved. The directors express their satisfaction with the work of the agents and staff in Ceylon, and look forward to being able to declare the full dividend next year.—*H. & C. Mail*, October 13.

PLANTING NOTES.

A FINE RUBY.—The Ruby Mines Company, Limited, of Mogok, have been fortunate enough to discover a very fine ruby, which gives promise of being a very valuable stone. It weighs 75 carats and looked at in the rough state is perfectly flawless and clear. It is valued now at over twenty-five thousand pounds sterling.—*Burma Times*, October 21st.

CHLORIDE OF LIME AND INSECT PESTS.—The *Indian Planters' Gazette* states that if chloride of lime is spread on the soil or near plants, insects and vermin will not be found near them. By its means plants are easily protected from insect plagues, by simply sprinkling upon, or brushing over, their stems with a solution of it. The solution should be ½ lb. of chloride to a pail of water, and the mixture one ounce of chloride to eight ounces of lards.

THE GARDENERS' MAGAZINE.—The object of this magazine is to represent gardening, agriculture, Horticulture and the allied sciences in all their branches. At present "The Gardener's Magazine, will be issued once a month. Any amount paid as subscription will be thankfully received by the Publisher: and those who will pay anything for its support will receive ornamental and flowering plants from the Agricultural and Horticultural Nursery at their option.—Its address is 8 Gopal Nagor Road, Calcutta.

RUBBER EXPORT FROM BRAZIL.—During the first six months of 1899 the total amount of rubber exported from Brazil was 9,441,988 kilogrammes, of which 3,103,452 kilogrammes were sent to Europe, and 6,338,536 kilogrammes to the United States. According to quality there were 5,271,167 kilogrammes of fine rubber; 733,288 kilogrammes of demi-fine; 2,599,759 kilogrammes of sernamby; and 897,774 of caucho.—*South American Journal*, Sept. 30th. [A kilogramme is slightly over 2 lb.—ED. *T.A.*]

A NEW FORAGE PLANT—the Sacalina (Polygonum Sachalinense), is being tried in the Provinces of Buenos Ayres and Entre Rios. It is a native of Siberia and is credited with possessing a number of desirable qualities, being said to grow on any soil and in any climate, to be unaffected by extremes of temperature and to resist a prolonged drought. Cattle eat it greedily, green or dry, and it is highly nutritious, owing to the amount of nitrogen it contains. Such a list of virtues ought to insure for it a pretty extensive cultivation.—*South American Journal*, Sept. 30.

COFFEE AND COCONUT PLANTING IN SELANGOR.—Coffee and coconut planters will be interested in the extracts, which we publish on page 347, from the minutes of a meeting of the Selangor Planters' Association. Coffee planting seems to be in a bad way in that part of the world and help is sought from the Government in the way of remitting the quit-rent. An appeal is also made to Government to take steps to preserve coconut plantations from the ravages of beetle pests. The labour question is also a prominent one there as elsewhere, and the Selangor planters should take a leaf out of the Ceylon book with regard to co-operation and federation.

Ceylon Rainfall.

The P. W. D. Meteorological Observations for Sept 1899.—We append this Monthly Return of rain from which it will be seen that the highest fall was at Padupola in the Central Province, 28·04 inches, and the lowest at Naulla, in the Eastern Province, 0·10 inches.

Western Province.

Negombo, Mr. Bucknall (6) ... 0·71
Kalutara Mr. Gregson (36) 3·33
Labugama, Mr. Bond (369) .. 7·07
Henaratgoda, Mr. Silva (33) ... 3·57

Central Province.

Katugastota, Mr. Morgan (1,500) .. 5·04
New Valley, (Dikoya) Mr. Ward (3,708) .. 12 34
Helboda, (Pussellawa) Not received (3,300) ... —
Yarrow Estate, Mr. Peto (3,400)... 18·57
Peradeniya Mr. Perera (1,540) ... 7 47
Duckwari, Mr. Spence (3,300) ... 8·71
Caledonia, Mr Goork .. (4,273) ... 6·28
Pussellawa, Mr. Powell (3,000) .. 10·68
Hakgala, Mr. MackMillan (5,581) .. 5·68
S. Wanarajah Estate, Mr. Tatham (3,700) ... 11·70
St. Andrew's (Maskeliya,) Not received (4,200)... —
Padupola, Mr. Ward ... (1,636) ... 28·04
Mylapitiya, Mr. Fletcher (1,707) ... 0·90

Northern Province.

Mullaittivu, Mr. Sanmukam (12) . 2·91
Jaffna Mr. Kretser (8) 1 91
Mankulam, (N. Road) Mr. Walker (167) .. 3·59
Elephant Pass, Mr. .. Silva (7) .. 0·20
Vangalachettykulam, Mr. Oorloff (179) ... 3·80
Point Pedro, Mr. Pararacha-singhe (24) .. 1·24
Jaffna College, Mr. Cooke (9) ... 1·95
Kayts, Mr. Kretser ... (8) .. 1·37
Kankesanturai, Mr. ... Adams (10) . 3·07
Pallai, Mr. Silva (24) .. 0·88
Murikandy, (North-Central Road) Not received — --
Nedunkeni, Mr. Sanmukam (122) ... 4·77
Chavakachcheri, Mr. Silva (16) ... 2·78
Udupiddi, Mr. Hastings (35) ... 1·58
Marichchukaddi, (14) Mr. Thamotharampillay Nil
Murungan, Mr. Blechingberg (52) 0·13
Vavuniya Mr. Walker (318) 2·09

Southern Province.

Ella Vella (262) Mr. Smith 2·24
Kekanadura, (150) do 1·55
Denagama, (286) do 2·95
Uaukiriwila Mr. Lourensz (235) ... Nil
Kirama, Mr. Ismail (260) 0·39
Hali-ela (200) Mr. Smith 2·65
Tissamaharama, Not received (75) ... —
Matara (15) Mr. Smith 2·77
Dandeniya, (157) do . 3·67

Urubokka, Mr. Vanderstraaten (890) ... 5·16
Elagala, Not received (121) —
Tangalla, (94) Mr. Barttlett ... 0·34
Mamadola, Mr. Cade (56) ... 0·34

Eastern Province.

Irrakkamam, (42) Mr. Bower ... 1·21
Devilana, Mr. Vanderstraaten (136) Nil
Sagamata, Mr Bower (40) ... 0·60
Ambare, do (65) 0·20
Kanthalai, Mr. Carte (150) 1·61
Allai, Mr. Carte (95) 5·65
Rukam, Mr. Vanderstraaten (120) .. 2·80
Periyakulam, Mr. Carte (20) ... 6·35
Chadaiyantalawa, Mr. Edge (57) ... 0·21
Kalmunai, do (12) 1·06
Rotewewa, do (30) 1·07
Lahugala, do (70) 1·10
Naulla, do (30) 0·10
Andankulam, Mr. Carte (41) ... 3·75
Manalpuddy, Mr. Vanderstraaten (21) 0·90
Maha-Oya-Tank, Mr. Vanderstraaten (190) 4·44

N.-W. Province.

Magalawewa, Mr. Dasanaike (176) .. 0·35
Maha Uswewa tank, Mr. Crabb (160) ... 0·26
Tenepitiya, Mr. Churchill (8) ... 1·45
Batalagoda, Mr. Fonseka — 2·51

N.-C. Province.

Kalawewa, (268) Mr. Carson Nil
Maradankadawala, Mr. Carson (443) ... 2·09
Mihintale, Mr MacBride (354) ... 4·43
Horowapotana, Mr. MacBride (217) ... 4·00
Madawachchiya, Mr. MacBride (285) ... 2·96
Topare, (200) Mr. Jayewardane ... 0·40
Miuneriya — Mr. Eves 1·56

Uva Province.

Bandarawela, Mr. Tocke (4,000) ... 1·93
Haldummulla, Mr. Viramuttu (3,160) ... 1·70
Kumbukan, (446) Mr. Emerson ... 1·40
Koslanda, (2,258) Mr. Emerson ... 0 83
Tanamalwila, Not received (550) ... —
Bible, Mr. Silva (680) 2·62
Taldena, Mr. Fernaudo (1,100) ... 0·96

Sabaragamuwa.

Ambanpitiya, Mr. Caldicott (729) 4·71
Pelmadulla, Mr. Clarke (408) 1·37
Kolonna Korale (Hulanda-oya) (203) Not received —
Avisawella, Mr. Jeffery (105) ·45

Ceylon Rainfall.

S. G. O. Meteorological Observations for April, 1899.

We append the total fall of rain from which it will be seen that the highest fall was at Kobonella Estate, Rangala, 40·61 inches, and the lowest at Batticaloa, 2·32 inches.

Colombo (40) 6·66
Ratnapura (84) 14·97
Puttalam (27) 7·93
Anuradhapura (295) 10·49
Mannar (12) 8·25
Jaffna .. 5·65
Trincomalee (12) 3·29
Batticaloa (26) 2·32
Hambantota (40) 2·93
Galle (48) 8·03
Kandy (1,654) 16·56
Nuwara Eliya (6,188) 11·02
Hakgala, Nuwara Eliya (5,581) 11·97
Badulla (2,225) 10·36
Vavuniya (317) instruments removed
Kurunegala (381) 17·06
Maligakanda, Colombo Mr. Johnson (70) 9·61
Agricultural School — Colombo, Mr. Rodrigo 9·99
Wilhelmina Puttalam, Mr. Ratnayeke (131) 8·15
Horakele Estate, Chilaw, Mr. Beven (50) 8·63
Chilaw Kachcheri Chilaw, Mr Koch (10) 4·10
Franklands Estate —
Veyangoda, Mr. Beven 4·13
Orange Hill, Ragama Mr. Bury (50) 13·32
Henaratgoda Gardens, Henaratgoda, Mr. de Silva (33) 10·43
Kotua Godella, Rambuk'a Mr. Windus (550) 11·50
Eadella or Liberia Estate Polgahawela Mr. Kynaston (425) 19·27
Geekianakanda, Neboda — Mr. Towgood (200) 7·23
Polgahakanda, Neboda Mr. Wight (500) 11·54
Labugama, Hanwella. Mr. Samarakone (369) 19·54
Rayigam, Horana, Mr. Hanson, (0) 15·40
Kanangma, Avissawella Mr. Cooke (200) 21·64
Dunedin Estate, Avissawella, Mr. Bayley, (400) 20·57
Digalla Avisawella, Mr. Tottenham, (400) 22·63
Pambagama, Avisawella, Mr. Bridgman (600)
Avisawella Estate Avisawella Mr. Byrde (250) 17·54
Yatideriya, Kegalla, Mr. Fairweather — 26·14
Mahawalatenna, Balangoda Mahawalatenna R.M. — 10·81
Agarsland Estate Balangoda Mr. Boyd (2,215)
Maduwanwala, Rakwana, Maduwanwela R.M. (750) 11·39
Anninkanda, Morawaka, Mr. Woodhouse (1,400) 12·34
Panilkanda, Morawaka, Mr Davidson. (2,000) 14·13
St. John Del Rey, Bogawantalawa Mr. Glanville (4,300) 14·32
Friedland, Bogawantalawa Mr. Rammell (5,200) 17·36
Campion, Bogawantalawa, Mr. Saunders (4,810) 14·04
BlairAthol, Dikoya, Mr. Lane (3,641) 15·98
Annfield, Dikoya, Mr. Knight (4,350) 11·47
Maskeliya Hospital, Maskeliya Mr. Oorloff (4,200) 17·75

Hope Estate, Hewaheta, Mr. Bagot (5,100) 16·81
Coldstream Estate, Watawala Mr. Speedling (3,800) 9·66
Holmwood Est., Agrapatana Mr. Gray (5,240) 11·56
Sandringham, Agrapatana Mr. Orchard (5,200) 11·56
Gingran-oya, Kotmale, Mr. Cox (3,800) 10·27
Labookelle, Ramboda, Mr. Stone (5,000) 15·16
Dunsinane, Pundalu-oya, Mr. Metcalfe 4,800 9·14
Sogama, Pussellawa, Mr. Eustace (3,500) 15·21
Kurundu-oya, Maturata, Mr. Owen (5,150) 16·70
Kabaragalla, Maturata, Mr. Maclean (4,200) 13·55
Maragalla Estate, Moopana, Mr. Betts, (2,200) 14·43
Moopana, Hospital, Moopana (Mr. Thomasz) (500) 13·56
Madulsima Hospital Lunugala Dr. Vethecan (3,400) 19·02
Meeriabedda, Haputale, Mr. Dupuis (3,600) 27·52
Udahena Estate, Haputale, Mr. Coombe (4,500) 30·54
Post Office, Bandarawela, Mr. Rodrigo (4,033) 8·59
Callander, Ohiya Mr. Green (5,125) 25·35
Mariawatte, Gampola Mr. Salmond (1,600) 16·98
Orwell Estate, Gampola Mr. Taylor (1,800) 16·85
New Forest, Deltota. Mr. Wardrop (3,500) 21·38
Rajawella, Estate, Teldeniya Mr. Murray (1,500) 13·96
Lower Spring Valley, Badulla Mr. Rettie (3,650) 18·13
Gourakele Estate, Badulla Mr. Hope (1,200)
Mosagalla Estate, Badulla, Mr. Deaker (4,500) 24·85
Ledgerwatte, Badulla Mr. Rettie (4,000) 10·36
Dea Ella Estate, M'walateuua Mr. Vanderslott (800)
Sembawatte Estate, N'pitiya Mr. Roe (1,600) 15·59
Gammaduwa, Estate, Rattota Mr. Westland (2,400) 16·02
Kobonella Estate, Rangala, Mr. Pole (3,300) 40·61
St. Martins, Rangala, Mr. Wyllie (3,600) 27·97
Crystal Hill, Matale, Mr. Van S'rex (1,400) 13·23
Vicarton Estate, Matale Mr. Carrie (3,250) 17·12
Matale Mr. Tisseverasinghe (1,208) 12·14
Wariapolla, Matale, Mr. Dickenson (1,200) 14·52
Dambulla, Mr. Sinnetamby (400) 14·59
Kotta Estate, Pallai, Mr. Todd (13) 7·14
Mantota Hospital, Mannar, Mr. Adams (17) 7·22
Buttala Hospital, Buttala, Mr. Bulner — 14·39
Police Station, Hatton Police Constable Miskin (4,141) 10·90
Medway Estate Nilaveli, Mr. Abraham, ... 3 79
Delwita, Kurunegala, Mr. Neame (490) 15·03
Woodside, Uragalla Mr. MacMahon (3,000) 20·34
Gillardstown, Wattegama Mr. Hardy (2,500) 22·37

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Name of Company.	Amount paid per share.	Buyers.	Sellers.
Agra Ouvah Estates Co., Ltd.	500	900	—
Ceylon Tea and Coconut Estates	500	—	500 n'l
Castlereagh Tea Co., Ltd.	100	90*	95
Ceylon Hills Estates Co., Ltd.	100	—	30
Ceylon Provincial Estates Co.	500	485	500
Claremont Estates Co., Ltd.	100	—	20
Clunes Tea Co., Ltd.	100	—	90
Clyde Estates Co., Ltd.	100	—	80
Delgolla Estates Co., Ltd.	400	--	140
Doomoo Tea Co., of Ceylon, Ltd.	100	60	—
Drayton Estate Co., Ltd.	100	150	—
Ella Tea Co., of Ceylon, Ltd.	100	60*	65
Estates Co., of Uva, Ltd.	500	—	350
Gangawatta	500	—	—
Glasgow Estate Co., Ltd.	500	—	900
Great Western Tea Co., of Ceylon, Ltd.	500	640*	—
Hapugahalande Tea Estate Co Ltd	200	—	250
High Forests Estates Co Ltd	500	550	—
Do part paid	350	390	400
Horekelly Estates Co., Ltd.	100	80	—
Kalutara Co., Ltd.	500	—	390
Kandyan Hills Co Ltd.	100	—	80*
Kanapediwatte Ltd.	100	—	87·50*
Kelani Tea Garden Co., Ltd.	100	—	65
Kirklees Estates Co., Ltd.	100	—	140
Knavesmire Estates Co., Ltd.	100	—	75
Malia Uva Estates Co., Ltd	500	—	575
Mocha Tea Co., of Ceylon, Ltd.	500	625	650
Nahavilla Estate Co., Ltd.	500	—	500
Neboda	500	500	—
Nyassaland Coffee Co. Ltd.	100	—	90
Ottery Estate Co., Ltd.	100	110	150
Palmerston Tea Co., Ltd.	500	—	415
Penrhos Estates Co., Ltd.	100	95	100
Pine Hill Estate Co., Ltd.	60	—	50
Pitakanda Tea Company	500	1,000	—
Putupaula Tea Co., Ltd.	100	—	100
Ratwatte Cocoa Co., Ltd.	500	—	500 n'l
Rayigam Tea Co., Ltd.	100	—	67·50
Roeberry Tea Co., Ltd.	100	45	50
Ruanwella Tea Co., Ltd.	100	—	75
St. Hellers Tea Co., Ltd.	5 0	500	—
Talgaswela Tea Co., Ltd.	100	—	35 n'l
Do 7 per cent. Prefs.	100	80	..
Tonacombe Estate Co., Ltd.	500	—	450
Udabage Estate Co., Ltd.	100	..	40 n'l
Udugama Tea & Timber Co., Ltd.	50	..	10 n
Union Estate Co., Ltd.	500	—	300
Upper Maskeliya Estate Co., Ltd.	500	..	500
Uvakellie Tea Co., of Ceylon, Ltd.	100	65	70
Vogan Tea Co., Ltd.	100	—	85
Wanarajah Tea Co., Ltd.	500	—	1145
Yataderiya Tea Co., Ltd.	100	—	350*

Ceylon Commercial Companies.

Name of Company.	Amount paid per share.	Buyers.	Sellers.
Adam's Peak Hotel Co., Ltd.	100	..	60
Bristol Hotel Co., Ltd.	100	85	90*
Do 7 per cent Debts	100	102·50	—
Ceylon Gen. Steam Navgt. Co., Ltd.	100	—	210*
Colombo Apothecaries Co., Ltd	100	140	142·50*
Colombo Assembly Rooms Co., Ltd.	20	..	12·50
Do prefs.	20	..	17
Colombo Fort Land and Building Co., Ltd.	100	..	90*
Colombo Hotels Company	100	—	300
Galle FaceHotel Co., Ltd.	100	150	—
Kandy Hotels Co., Ltd.	100	100	—
Kandy Stations Hotels Co.	100	..	35
Mount Lavinia Hotels Co., Ltd.	500	—	350
New Colombo Ice Co., Ltd.	100	—	178*
Nuwara Eliya Hotels Co., Ltd.	100	20	25
Public Hall Co., Ltd.	20	15*	—
Petroleum Storage Co.	100	—	—
Do 10 % prefs.	100	—	40

* Transactions.

LONDON COMPANIES.

Name of Company.	Amount paid per share.	Buyers.	Sellers.
Alliance Tea Co., of Ceylon, Ltd.	10	8½—9	—
Associated Estates Co., of Ceylon Ltd.	10	..	6—7
Do. 6 per cent prefs.	10	..	9—9½
Ceylon Proprietary Co.	1	..	12·6—17·6
Ceylon Tea Plantation Co., Ltd.	10	..	26½—27
Dimbula Valley Co., Ltd.	5	—	5½—6
Do prefs.	5	—	5½—6
Eastern Produce and Estates Co., Ltd.	5	..	6¼
Ederapolla Tea Co., Ltd.	10	.	8—9
Imperial Tea Estates Ltd.	10	..	5—6
Kelani Valley Tea Asson., Ltd.	5	..	5—6
Kintyre Estates Co., Ltd.	10	..	8—9
Lanka Plantation Co., Ltd.	10	4½	5—6
Nahalma Estates Co., Ltd.	1	.	½—1
New Dimbula Co., Ltd.	1	—	2½—2¾
Nuwara Eliya Tea Est. Co., Ltd	10	..	9¾
Ouvah Coffee Co.,Ltd.	10	7	7
Ragalla Tea Estates Co., Ltd.	10	...	9½*
Scottish Ceylon Tea Co., Ltd.	10	..	14—16
Spring Valley Tea Co., Ltd	10	..	5—6
Standard Tea Co., Ltd	10	..	12—13
The Shell Transport and Trading Company, Ltd.	100	—	200
Yatiyantota Ceylon Tea Co., Ltd.	10	...	8—9
Yatiyantota pref. 6 o/o	10	..	10—10¼

BY ORDER OF THE COMMITTEE.

Colombo 27th October, 1899.

RAINFALL RETURN FOR COLOMBO

(Supplied by the Surveyor-General.)

	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897	1898	Av of 29yrs.	1899
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch	Inch	Inch	Inch.	Inch.
January ..	0·81	1·45	7·39	5·42	0·62	5·00	2·92	3·81	2·32	3·09	6·98
February ..	4·36	2·81	5·32	2·36	0·52	0·81	0·35	1·68	1·98	1·90	2·78
March ..	5·34	9·43	1·52	5·15	7·44	1·84	5·64	3·66	4·21	4·92	0·88
April ..	14·27	5.93	13·92	20·39	12·51	9·34	5·93	10·97	22·81	11·47	6·66
May ..	6·48	17·65	3·00	10·32	3·00	10·09	9·31	8·30	5·80	11·89	17·73
June ..	1·87	9.79	6·62	11·01	11·32	13·99	8·37	10·14	10·94	8·34	9·23
July ..	3·32	4·59	1·10	2·20	1·72	0·52	2·85	5·24	6·15	4·49	1·11
August ..	0·73	1·65	1·86	1·01	0·86	0·92	6·35	9·09	0·97	3·77	0·62
September	1·50	4·42	1·14	1 99	0·78	4·09	10·99	4·58	6·90	5·13	1·48
October ..	18·33	35·28	12·24	5·59	20·81	30·36	16·78	4·71	20·60	14·57	12·99*
November..	12·32	18·37	5·86	18·10	14·63	5·83	19.81	11·66	17·38	12·80	
December..	8·47	7·66	0·86	6·13	3·25	9·44	11·76	8·89	3·05	6·45	
Total..	72·80	119·03	60·83	89·67	77·46	92·23	101·06	82·73	103·11	88·82	60·46

* From 1st to 31st Oct. 12·99 inch, that is up to 9·30 a.m. 1st Nov.—Ed. *C.O.*

A Substitute for Indiarubber.—We give in full the letter (see page 338) in the last *Spectator* from a retired Italian Duke, about a possible substitute for "Indiarubber." Our absent Editor writes respecting it:—"I have little fear of the raw product being superseded. Quinine, even when £1 an ounce, was never superseded, much as we heard of laboratory work." It will, however, be interesting to note if the surviving brother of the late Mr. Alfred Nobel, the inventor of the substitute, makes any use of his valuable fraternal legacy, the fruit of an ingenious mind.

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

Colombo 31st Oct. 1899.

EXCHANGE ON LONDON :—Closing Rates: *Bank Selling Rates*:—On demand 1/4 3-32 to ⅛; 4 months' sight 1/4 ⅛ to 3-16; 6 months' sight 1/4 5-32 to 3-16.

Bank Buying Rates:—Credits 3 months' sight 1/4 ⅜ to 13-32; 6 months' sight 1/4 9-16; Docts 3 months' sight 1/4 7-16 to 15-32; 6 months' sight 1/4 ⅝.

Indian Bank Minimum Rates 7 o/o

Local Rates: 1 % Higher.

COFFEE:—

Plantation Estate Parchment on the spot per bus—R10·00

Plantation Estate Coffee, f.o.b on the spot per cwt R70.00

Liberian Parchment on the spot per bus—None.

Native Coffee f.o.b per cwt. R36.00 Nominal.

TEA:—Average Prices ruling during the week—Broken Pekoe per lb. 43c. Pekoe per lb. 36c. Pekoe Souchong per lb. 32c. Broken Mixed and Dust per lb. 28c.—Averages of Week's sale.

CINCHONA BARK:—Per unit of Sulphate of Quinine per lb 7c. 1 o/o 4 o/o.

CARDAMOMS:—Per lb R1.80

COCONUT OIL:—Mill oil per cwt. None.

Dealers' oil per cwt. R14.00; Coconut oil in ordinary packages f.o.b. per ton R312.50

COPRA:—Per candy of 560 lb. R41.00

COCONUT CAKE:—(Poonac) f.o.b. per ton, R85.00

Cocoa unpicked & undried, per cwt. R43.25

Picked & Dried f. o. b. per cwt. R45.50

COIR YARN.—Nos. 1 to 8 { Kogalla per cwt. R17 25
{ Colombo ,, R16.00

CINNAMON:—Nos. 1 & 2 only f o.b. 67c. } The
Do Ordinary Assortment. per lb 56½c. } attention of the trade is called to the fact that considerable quantities of wild Cinnamon have been shipped from Colombo for some time back, and that the same is included in the returns of Cinnamon shipped.

EBONY.—Per ton Govt. sales 15th November.

PLUMBAGO:—Large Lumps per ton, R1,100

Ordinary Lumps per ton, R1,050

Chips per ton, R700, Dust perton, R600; Dust Flying R200.

RICE.—Soolai per bag, { R8.50 to 9.00
,, per bushel, { R3.20 to 3.37

Pegu & Calcutta Calunda per bushel. R3.40 to 3.50

Coast Calunda per bushel, R3.50 to R3.75

Mutusamba per bushel R3.75 to 4.00

Kadapa and Kuruwe, per bushel } None.
Rangoon, raw 3 bushel bag. }

Soolai Kara per bushel R3.17 to 3 30

Coast Kara per bushel R3.44 to 3.60

THE LOCAL MARKET.

(By Mr. James Gibson, Baillie St., Fort.)

Colombo, Oct. 31st, 1899.

COFFEE:—

Estate Parchment :—per bushel	} Nil	
Chetty do do		
Native Coffee } per cwt.	R33·00 to 36·00 Nominal	
do F. O. B }		
Liberian coffee:—per busbel	} Nil	
do cleaned coffee:—per cwt		
Cocoa unpicked:—per cwt	R35·00 to 41·00	
do cleaned do	R41·00 to 47·50	
Cardamoms Malabar per lb	R00·95 to 1·00	
do Mysore do	R1·65 to 1·90	

RICE:—

Soolai per bag of 164 lb. nett	R8·50 to 9·00
Slate or 1st quality:—per bushel	R3·30 to 3·35
Soolai 2 & 3rd. do do do	R3·20 to 3·30
Coast Calunda	R3·50 to 3·75
Coast Kara	R3·44 to 3·60
Kazala	R3·17 to 3·20
Muttusamba Ordinary	R3·75 to 4·00
Cinnamon. per lb No 1 to 4	R00·56½
do do 1 to 2	R00·62
do Chips per candy	R85 00 to 87·50
Coconuts Ordinary per thousand	R35·00 to 37 50
do Selected do	R36·00 to 38·50
Coconut Oil per cwt	R14·00
do do F. O. B. per ton	R280·00

POONAC:—

Gingelly per ton		R95·00 to 97·50
Coconut Chekku	do	R72·50 to 75·00
do Mill (retail)	do	R75·00 to 80·00

POONAC:—

Cotton Seed per ton	R70·00
Copra per candy	
Kalpitiya do	R41·00 to 41·50
Marawila do	R40·00 to 41·00
Cart Copra do	R36·50 to 40 00
Satinwood per cubic feet.	R2 00 to 2·25
do Flowered do	R5·00 to 6·00
Halmilla do	R1·90
Palu do	R1·00 to 1·12
Ebony per ton	R75·00 to 175·00
Kitul fibre per cwt	R30·00
Palmyra do do	R4·50 to 17·50
Jaffna Black Clean per cwt	R14·00
do mixed do	R12·50 to 13·00
Indian do	R8·00 to 13·50
do Cleaned do	R12·00 to 17·50
Sapanwood per ton	R50·00 to 55·00
Kerosine oil American per case	R6·25 to 6·50
do bulk Russian per tin	R2·90 to 2·95
do Russian per case	R5·95 to 6·00
Nux Vomica per cwt	R2·00 to 2·50
Croton Seed per cwt	R30·00
Kapok cleaned f o b do cwt	R25·00
do uncleaned do	R6·00
Plumbago per ton, according to grade — Large lumps	R700·00 to 1,000·00
do do	R550·00 to 950·00
Chips	R300·00 to 650·00
Dust	R100·00 to 500·00

CEYLON EXPORTS AND DISTRIBUTION 1899.

COUNTRIES	Tea. 1899 lbs.	Tea. 1898 lbs.	Coffee—cwt. Plantation	Coffee—cwt. N'tive	Coffee—cwt. Total.	Cinchona Branch & Trunk lb. 1899. lbs.	Cinchona Branch & Trunk lb. 1898. lbs.	Cocoa cwts.	C'moms lbs.	Cinnamon. Bales lbs.	Cinnamon. Chips. lbs.	Coconut Oil. 1899 cwts.	Coconut Oil. 1898 cwts.
To U.K. ..	83857219	80627843	13606	..	13606	430906	538939	32354	266281	983382	663466	136128	101867
,, Austria ..	7491	13398	1	..	1	..	..	...	...	..	105966	6173	9474
,, Belgium ...	13099	10540	95	..	95	..	4421	357	380	71060	95760	1602	903
,, France ..	80470	63694	165	...	165	3[illegible]	22471	34	...	70854	1750	.	4209
,, Germany ..	304126	273825	125	..	125	1630	..	22	25271	462489	507298	6542	9003
,, Holland ..	30211	22631	..	..	..	..	..	..	...	..	..	...	..
,, Italy ..	12471	6260	..	..	..	...	..	...	20	97000	117120	404	603
,, Russia ..	2719244	2140125	24	..	24	...	..	...	923	..	...	..	..
,, Spain ..	14300	36150	..	...	..	..	...	..	...	22[illegible]900	37800	..	..
,, Sweden ..	57362	33230	..	..	..	..	..	...	4036	5500	..	206	..
,, Turkey ..	15674	64434	1	..	1	..	...	..	636	...	..	..	..
,, India ..	442995	889408	132	..	132	..	..	1	45981	...	..	53896	107542
,, Australia ..	13210163	12662760	2923	..	2923	..	...	235	..	6450	24192	720	465
,, America ..	2657330	190[illegible]950	442	..	442	94005	186819	514	6240	130600	28000	81696	52761
,, Africa ..	236775	317000	9	..	9	...	724	..	2206	400	1240	...	10
,, China ..	1174743	977643	64	...	64	26015	11034	...	5951	45000	...	3184	2633
,, Singapore ..	57946	51113	79	..	79	..	–	..	480	..	..	22333	88692
,, Mauritius ..	80566	14759	..	..	..	..	..	..	...	...	..	..	..
,, Malta ..	226767	172794	..	...		...	..	..	..	..	..	..	...
Total export from 1st Jan. to 31st Oct. 1899	105198952	100285557	17666	..	17666	552589	764408	33517	358405	2093635	1582592	312884	378162

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, September 20th, 1899.

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine cwt.	Fair to fine dry ...	44s a 100s
Zanzibar & Hepatic ,,	Common to good ..	11s a 75s
BEES' WAX, ,,		
Zanzibar & Bombay White ,,	Good to fine	£6 a £7 10s
Zanzibar & Bombay Yellow ,,	Fair ,,	£5 10s a £6 10s
Madagascar ,,	Dark to good palish	£5 15s a £6 7s 6d
CAMPHOR, China ,,	Fair, average quality	125s
Japan ,,	,, ,, ,,	132s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	2s 6d a 2s 9d
	Middling, stalky & lean	1s 7d a 2s
Ceylon.—Mysore ,,	Fair to fine plump ..	3s 8d a 3s 10d
	Seeds .	1s 9d a 2s 5d
,, Tellicherry ,,	Good to fine ..	2s 11d a 3s
	Brownish ..	2s 6d
,, Long ,,	Shelly to good ..	2s 6d a 3s 6d
,, Mangalore ,,	Med brown to good bold	2s 3d a 3s 3d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	3¾d a 4¼d
Madras ,,	..	3½d a 3¾d
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	2 s 6d a 40s 6d
CINCHONA BARK.—		
Ceylon lb.	Crown, Renewed	5d a 7d
	Org. Stem	8⅞d
	Red Org. Stem	2¾d a 5¼d
	Renewed	3⅜d
	Root	2¼d
CINNAMON, Ceylon 1sts	Ordinary to fine quill	1s a 1s 7d
per lb. 2nds	,, ,,	9½d a 1s 7d
3rds	,, ,,	9d a 1s 5d
4ths	,, ,,	8½d a 1s 1d
Chips	,, ,,	½d a 8d
CLOVES, Penang lb.	Dull to fine bright bold	4½d a 1s
Amboyna ..	Dull to fine	4d a 5¼d
Zanzibar and Pemba	Good and fine bright	3¾d a 4½d
	Common dull to fair	3d a 3⅛d
Stems ..	Fair	2d
COCULUS INDICUS cwt.	Fair	8s
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	101s a 115s
	Middling to fine mid .	93s a 102s
	Low mid. and low grown	81s a 92s 6d
	Smalls	35s a 75s
Native	Good ordinary	30s a 70s
Liberian ,,	Small to bold	25s a 35s
COCOA, Ceylon ,,	Bold to fine bold	80s a 92s
	Medium and fair	65s a 77s 6d
	Triage to ordinary	4?s 6d a 62s 6d
COLOMBO ROOT ,,	Ordinary to good	13s 6d a 21s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair	£14 a £23
FIBRE, Brush ,,	Ord. to fine long straight	£10 a £21
Cochin ,,	Ordinary to good clean	£18 a £22
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £33
Cochin ,,	,, ,, very fine	£12 a £52
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	40s a 55s
CUTCH ,, ,,	Fair to fine dry	28s a 35s
GINGER, Bengal, rough ,,	Fair	21s
Calicut, Cut A ,,	Good to fine bold	69s 6d a 77s
B & C ,,	Small and medium	27s 6d a 50s
Cochin Rough ,,	Common to fine bold	22s
	Small and D's	17s a 20s
Japan ,,	Unsplit	20s 6d
GUM AMMONIACUM ,,	Sm. blocky to fine clean	20s a 45s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £20
	Part yellow and mixed	£8 2/6 a £10 10s
	Bean and Pea size ditto	70s a £9 2/6
	Amber and dk. red bold	£5 10s a £7 10s
	Med. & bold glassy sorts	80s a 100s
Madagascar ,,	Fair to good palish ..	£4 8s a £8
	,, ,, red ..	£4 5s a £9
ARABIC E. I. & Aden ,,	Ordinary to good pale	40s a 55s
Turkey sorts ,,		67s 6d a 85s
Ghatti ,,	Pickings to fine pale ...	12s 6d a 35s
Kurrachee ,,	Good and fine pale ...	52s 6d a 55s
	Reddish to pale selected	30s a 40s
Madras	Dark to fine pale ..	23s a 35s
ASSAFŒTIDA ,,	Clean fr. to gd. almonds	40s a 85s
	Ord. stony and blocky	12s 6d a 35s
KINO ,,	Fine bright	2s a 3s
MYRRH, picked ,,	Fair to fine pale	65s a 75s
Aden sorts ,,	Middling to good	33s a 55s
OLIBANUM, drop ,,	Good to fine white	35s 6d a 50s
	Middling to fair	25s a 35s
pickings ,,	Low to good pale	17s a 20s
siftings ,,	Slightly foul to fine	16s 6d a 18s
INDIARUBBER, Assam lb	Good to fine	2s 10½d a 3s 2¼d
	Common to foul & mxd.	1s 4d a 2s 6d
Rangoon	Fair to good clean ...	2s 9d a 3s 2d
	Common to fine	1s a 2s 4d

	QUALITY	QUOTATIONS
INDIARUBBER, (Contd).		
Java, Sing. & Penang lb.	Foul to good clean ..	8d a 3s 3½d
Mozambique ,,	Good to fine Ball ..	2s 8d a 3s 5¼d
	Ordinary to fair Ball..	2s a 2s 10d
	Low sandy Ball ..	1s 3d a 1s 6d
	Sausage fair to good	3s 2d a 3s 6d
	Liver and livery Ball	2s 4d a 3s 2d
Madagascar ,,	Fr to fine pinky & white	3s a 3s 4½d
	Fair to good black .	2s a 2s 3d
	Niggers, low to fine ..	1s a 2s 6d
INDIGO, E.I. ,,	Bengal--	
	Shipping mid to gd violet	2s 10d a 4s
	Consuming mid. to gd.	2s 6d a 2s 9d
	Ordinary to mid.	2s 2d a 2s 5d
	Mid. to good Kurpah	1s 11d a 2s 5d
	Low to ordinary	1s 8d a 1s 10d
	Mid. to good Madras	1s 4d a 2s 2d
MACE, Bombay & Penang	Pale reddish to fine	2s a 3s
per lb.	Ordinary to fair	1s 5d a 1s 11d
	Pickings	1s 1d a 1s 3½d
MYRABOLANES, Madras cwt	Dark to fine pale UG	6s a 6s
	Fair Coast	5s 6d a 6s
Bombay ,,	Jubblepore	4s 3d a 7s
	Bhimlies	4s 9d a 9s 6d
	Rhajpore, &c.	4s 3d a 8s
Bengal ,,	Calcutta	4s 6d a 6s
NUTMEGS— lb.	34's to 57's	2s 4d a 2s 6d
Bombay & Penang ,,	110's to 65's	1s 1d a 2s 3d
	160's to 130's	6d a 11d
NUTS, ARECA cwt.	Ordinary to fair fresh	12s a 21s
NUX VOMICA, Bombay	Ordinary to middling	4s a 5s 6d
per cwt. Madras	Fair to good bold fresh	7s a 10s
	Small ordinary and fair	5s 6d
OIL OF ANISEED lb	Fair merchantable	5s 11d
CASSIA ,,	According to analysis	3s 11d a 5s 6d
LEMONGRASS ,,	Good flavour & colour	2¾d a 2⅞d
NUTMEG ,,	Dingy to white	3d a 3½d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 6d
CITRONELLE ,,	Bright & good flavour	11d a 1s 1/0½d
ORCHELLA WEED—cwt.		
Ceylon ,,	Mid. to fine not woody .	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf ..	10s a 16s
	,, wiry Mozambique	10s a 11s
PEPPER (Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ..	5½d a 5⅝d
Singapore	Fair	5 9-.6d a 5⅝d
Acheen & W. C. Penang	Dull to fine ...	4¾d a 5¼d
PLUMBAGO, lump cwt.	Fair to fine bright bold	64s a 72s
	Middling to good small	25s a 50s
chips ,,	Dull to fine bright ..	33s a 57s 6d
dust ,,	Ordinary to fine bright	12s a 35s
SAFFLOWER ,,	Good to fine pinky	60s a 65s
	Inferior and pickings	40s a 57s 6d
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£20 a £35
Chips ,,	.. ..	5s a £8
Madras, Logs ,,	Fair to good flavour ..	£20 a £30
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Bombay ,,	Lean to good ..	£4 a £5
Madras ,,	Good average	£4 a £5 nom.
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth .	£6 a £7
SEEDLAC cwt.	Ord. dusty to gd. soluble	55s a 60s
SENNA, Tinnevelly lb	Good to fine bold green	5d a 6¾d
	Fair middling medium	3¼d a 4¾d
	Common dark and small	2¼d a 2¾d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's	£4 a £6 2s 6d
	D's and B's	
	Small ...	
Mussel ,,	Small to bold ..	£1 a £2 17/6
TAMARINDS, Calcutta	Mid. to fine bl'k not stony	15s a 16s
per cwt. Madras	Stony and inferior ..	7s 6d a 8s 6d
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	18s 6d a 23s
TURMERIC, Bengal cwt.	Fair ..	22s
Madras ,,	Finger fair to fine bold bright	26s a 27s
Do. ,,	Bulbs ..	17s
Cochin ,,	Finger .	21s
	Bulbs ..	9s a 9s 6d
VANILLOES— lb.		
Mauritius and Bourbon 1sts	Gd. crystallized 3½ a 9 in	20s a 29s 6d
2nds	Foxy & reddish 4½ a 8 ,,	21s a 25s
Seychelles 3rds	Lean and inferior ...	10s a 14s
VERMILION lb.	Fine, pure, bright ...	2s 3d a 2s 4d
WAX, Japan, squares cwt	Good white hard ...	30s a 31s

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for November :—

Vol. XI.] NOVEMBER, 1899. [No. 5.

VETERINARY NOTES.

A case of cancer in a dog was brought to me for treatment about the 15th of June, with the history that the animal was landed only a couple of days or so ago. The animal was twice before operated on in England.

I noticed the sheath enormously swollen, with a bloody discharge of the characteristic symptom of cancer in penis, was noticeable. The case was taken in hand, and operated on by me, and the cancerous portion entirely removed. I informed the client that this operation would not readily effect a cure, if the animal was not castrated; for when the growth was cut away, the cancer would have more room to spread, and so the necessity of an operation for castration was brought home to my client, who agreed with great hesitation, thinking that the animal being old, might not be able to stand the operation; besides, the owner of the dog (Col. Webster) was away.

The dog underwent the operation, and being a pet animal the effects of the operation were very much felt, but with difficulty he came round. Soon after the wounds of castration were healed. I examined the sheath and found another crop of cancer which had to be removed, but with less difficulty than in the former instance. I did not see the animal after this till he was brought to me on the 13th September, when I noticed just a bit of growth at the root of and inside the sheath; this too I removed. Finally, the animal was brought to me on the 16th October, when I hardly noticed any growth or bloody discharge. The operation of castration not only prevented the spread of this baneful disease, but helped a great deal in the cure.

Though the method of firing and blistering of the out-of-date farrier has now given way to the more rational treatment of the modern Veterinary Surgeon, branding or the use of the actual cautery is still admitted to be indispensable under certain circumstances. It is therefore not fair to put it down as being a relict of a barbarous age, but it should be recognised that though at one time it was practised indiscriminately it is now adopted in extreme cases under expert veterinary advice. This is how matters stand in advanced countries where the necessity for veterinary control over the treatment of animals is recognised, but in Ceylon it is found that laymen are the censors when questions of "cruelty" in the form of branding are to be decided, and this leaves matters in as unsatisfactory a state as under the old system, so that it becomes a question with us whether the native empiric cattle doctor who is allowed to practise his "profession" without let or hindrance is a better judge of the necessity of branding or the inexperienced laymen who generally sit in judgment on him. The only equitable way of settling the question of cruelty or otherwise in cases of branding, when there is reason to suspect cruelty, is by referring the matter to an expert.

"MANGO LODGE," CINNAMON GARDENS,

DEAR SIR,—I herewith send you a copy of a letter received from George Murray, Esq., of Pallekelle. I would like to add that the material used in this case was not pure but glycerinated

bile, and the animals had, as a matter of necessity, to be worked in an infected area, after inoculation, and before the usual 10 days were elapsed. From Mr. Murray's report, the mortality in this case of inoculation was only 20 per cent. Let me quote a para. that previously appeared in the *Ceylon Independent*:—

"Mr. Hoole, Government Veterinary Surgeon, who returned a few days ago from Kandy, reports that active steps are being taken by the Government and Municipal authorities there to check the spread of murrain. It appears that the inoculations at Pallekelle Estate have unfortunately failed, judging from the percentage of inoculated animals that got the disease and succumbed to it. The Superintendent, Mr. Murray, is however, unremitting in his efforts at combatting the outbreak, and it is to be hoped that the system of isolation and disinfection, which is energetically carried on on this estate will have its desired effect."

It will thus be seen that it was hardly fair to characterise inoculation at Pallekelle as a *failure*.

Yours faithfully,
(Signed) A. CHINNIAH, *Vet. Surgeon.*

(Copy of letter referred to.)

PALLEKELLE, KANDY,
12th October, 1899.

Dr. CHINNIAH,
Alston Lodge, Cinnamon Gardens, Colombo.

DEAR SIR,—I regret the delay in replying your letter, owing to my cattle conductor having left me, and I could not have found out earlier how many of the cattle you inoculated died. Two bulls died out of the ten you inoculated.

Yours faithfully,
(Signed) G. MURRAY.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF AUGUST, 1899.

1	Tuesday ..	Nil	17	Thursday ..	Nil
2	Wednesday..	Nil	18	Friday ..	Nil
3	Thursday ..	Nil	19	Saturday ..	Nil
4	Friday ..	Nil	20	Sunday ..	Nil
5	Saturday ..	Nil	21	Monday ..	Nil
6	Sunday ..	Nil	22	Tuesday ..	Nil
7	Monday ..	Nil	23	Wednesday	Nil
8	Tuesday ..	·01	24	Thursday ..	·55
9	Wednesday...	Nil	25	Friday ..	·1
10	Thursday ...	Nil	26	Saturday ...	Nil
11	Friday ...	Nil	27	Sunday ...	Nil
12	Saturday ...	Nil	28	Monday ...	Nil
13	Sunday ..	Nil	29	Tuesday ..	Nil
14	Monday ...	·15	30	Wednesday	Nil
15	Tuesday ..	Nil	31	Thursday ..	Nil
16	Wednesday	Nil	1	Friday ..	·2
				Total...	1·01

Greatest amount of rainfall in any 24 hours on the 24th inst. was ·55 inches.

Mean rainfall for the month ·3 in.

Recorded by Mr. J. A. G. RODRIGO.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF SEPTEMBER, 1899.

1	Friday ...	·2	17	Sunday ..	·29
2	Saturday ...	Nil	18	Monday ..	Nil
3	Sunday ...	Nil	19	Tuesday ...	Nil
4	Monday ..	Nil	20	Wednesday	Nil
5	Tuesday ..	·2	21	Thursday ...	Nil
6	Wednesday...	Nil	22	Friday ...	Nil
7	Thursday ...	Nil	23	Saturday ...	Nil
8	Friday ...	Nil	24	Sunday ...	Nil
9	Saturday ...	·11	25	Monday ...	Nil
10	Sunday ...	Nil	26	Tuesday ...	Nil
11	Monday ...	Nil	27	Wednesday	Nil
12	Tuesday ...	·46	28	Thursday ...	Nil
13	Wednesday	Nil	29	Friday ...	Nil
14	Thursday ...	Nil	30	Saturday ...	Nil
15	Friday ...	Nil	1	Sunday ...	Nil
16	Saturday ...	Nil			
				Total...	1·06

Greatest amount of rainfall in any 24 hours on the 12th inst. was ·46 inches.

Mean rainfall for the month ·3 in.

Recorded by Mr. J. A. G. RODRIGO.

ORIGIN AND FORMATION OF ORGANIC MATTER IN PLANTS.

(Continued).

By the term respiration we understand the phenomena of the absorption of oxygen and the evolution of carbon dioxide. Respiration occurs in all plant organs, and is a function of such importance that when interfered with by the exclusion of oxygen the death of the plant results. If the roots, buds, moistened seeds, and branches of a plant be placed in a flask, and a current of air free from carbon dioxide be passed over them and then led through a solution of barium hydrate, the latter will become milky, due to the formation of barium carbonate, thus showing that the vegetable matter has evolved carbon dioxide The leaves throw off carbon dioxide except when they are exposed to the light and respiration is masked by assimilation. During the night or in dense shade they throw off carbon dioxide. When the relation between the oxygen absorbed and the carbon dioxide evolved is carefully determined, it is found that this relation is considerably modified by the temperature to which the leaves are exposed. In a low temperatnre the oxygen absorbed is usually greater than the carbon dioxide evolved, while in a high temperature the reverse is true, that is, there is more carbon dioxide evolved than oxygen absorbed. Since one volume of carbon dioxide contains exactly one volume of oxygen, it is evident that when the volume of carbon dioxide evolved is greater than the oxygen absorbed the plant is losing oxygen. This explains how the glucoses which are found in the pods of colza are transformed into the fatty substances of the seed, and how inosite and its derivatives formed by cholorophyll action in caoutchouc trees give a resin which is devoid of oxygen. The nature of this transformation has not yet been

explained, but the above observations indicate that these substances, like starch, cellulose, and sugar, are derived from forenic aldehyde, which as already explained, is assumed to be the primary substance from which all plant substances are built up. The formation of acids in plant tissues is explained more easily than that of fatty substances and resins. When starch or sugars are subjected to the action, of dilute nitiric acid, oxalic acid is produced. Similar treatment of other saccharine bodies results in the production of tartaric acids. Plant acids are due to a partial oxidation of neutral substances. When the carbohydrates oxide at a low temperature, or the penetration of oxygen into the tissues of the plant is interfered with by the structure of the organs, combustion of the neutral substances is not complete, *i.e.*, they are not reduced to carbon dioxide and water. In this case, the oxygen combines with the substances to produce acids. For example, considerable amounts of oxalic acids and oxalates are found in the juice of the cactus, especially the prickly pear, which is but slightly permeable to air. When, therefore, the volume of oxygen absorbed is greater than of carbon oxide evolved, it may be assumed that oxygen has been fixed by organic compounds in the plant to produce acids. These acids, then, are derived from neutral substances by oxidation, and, consequently, trace their ultimate origin to the decomposition of the carbon dioxide in the chlorophyll cells. In the experiment to which attention was called at the beginning of this article it would have been impossible to grow peas without adding a few cubic centimetres of an infusion of fertile soil to the sand. If this precaution were not observed with the peas, or if the seed of some non-leguminous plant were used, the experiment would be a failure. The seed would produce a sickly plant which would soon die of starvation due to the absence of one of the elements—nitrogen—necessary to its development. Although the leaves of plants grow in an atmosphere four-fifths of which is nitrogen, they are entirely incapable of directly utilising this element.

The process by which the free nitrogen of the atmosphere is utilised by plants has only been explained in comparatively recent years. Hellriegel and Wilfarth in 1886 reported experiments which demonstrated the ability of Leguminosae to attain normal development in soil absolutely deprived of organic matter, the only precaution necessary being the addition of a small account of an infusion of fertile soil. A few weeks after the addition of the infusion the roots of the leguminous plants were covered with tubercles, which microscopic examination showed to be filled with micro-organisms.

Breal has shown that inoculations may readily be made with these organisms by pricking a tubercle with a needle and then inserting it into a growing root.

The tubercle bacteria have been cultivated and their products have recently been brought into commerce under the name of "Nitragin," which is used for supplying these organisms to soils which are deficient in them. The growth of leguminous plants in sterile sand depends upon the presence on their roots of tubercles filled with these organisms. Through their agency the plant is supplied with nitrogen for the production of nitrogenous matter, so that if the mineral elements are present in sufficient quantity the plant makes normal growth. The plant profits by the nitrogen furnished by the bacteria, while the latter utilise the carbonaceous matter supplied by the plant, thus establishing a symbiosis. Although the process of fixation of nitrogen by the organisms and its utilisation by the plant has not yet been clearly explained, we can understand how that, notwithstanding the great quantities of nitrogen carried away from the soil with every cutting of lucerne or clover, the amount of nitrogen in the soil increases rather than decreases.

MEMS. ABOUT FRUITS.

The proper manipulation of trees in transplanting is a subject about which most people know very little. It is not uncommon to see trees furnished with masses of roots and planted with the utmost care, prove failures. Those who have had the greatest experience in this matter advice that fruit trees with the roots pruned back are more successful than trees with the ordinary supply. We generally find severe pruning of roots practised in transplanting coconut palms, but the same practice is avoided when fruit trees have to be dealt with. Why this difference in the treatment of transplanted trees?

It is well known to gardeners that an injured root is a source of decay in a transplanted tree, and that the best thing to be done under the circumstances is to remove the injured portion by means of a clean cut. A clean cut wound is easily healed over but not so a jagged one. Now in transplanting it is idle to expect that the roots—however carefully they may be treated—will escape injury. After transplanting, it is not until the roots throw out new white fibres that they are of any use to the tree, and it is well known that these fibres are sooner developed from pruned than from unpruned roots.

The selling price of plantains in the London market does not appear in the usual price lists of tropical produce. It is, therefore, interesting to find in an Exchange, a note to the effect that in July last though the arrival of bananas in London was heavy, the demand was equal to the supply, and the price ranged from 7 to 10 shillings per bunch.

It is astonishing with what pertinacity a name, no matter how enormous and absurd, will stick to a thing after once it has come into general use. Professor Van Denan, the well-known pomologist, referring the name "grapefruit" as applied to the pumelo, expresses the hope that intelligent fruit growers would abandon the absurd and inappropriate name "grapefruit" and use in its stead the proper name "pumelo." "What relation," he asks, "can there be in that large citrus fruit to the grape? Every one that knows anything of pomelo, except it be the most ignorant tyro in pomology, knows there is none. Then why perpetuate such nonsense? The fruit is called pomelo or pumelo in its native East Indian home; and it is called the same in the books on pomology; yet,

because some ignoramus in Florida once started the outlandish name "grapefruit," many persons stick to it in the face of the known facts to the contrary. Pomelo is short, euphonic, plain, historic and sensible. "Grapefruit" has none of these facts in its favour. In the name of common sense and intelligent pomological usage, I beg of everyone—growers, shippers, dealers, consumers and rural editors—to talk, speak, write and print the true name pomelo in referring to this one of our luscious fruits."

The following details of the sale of a small shipment of pine apples received from the West Indies by Messrs. John Haddon & Co., of London, will be of interest to fruit growers :—

		s.	d.		£	s.	d.
40 pines	@	1	1	=	2	3	4
40 "	@	0	10	=	1	13	4
41 "	@	0	8	=	1	7	4
40 "	@	0	6	=	1	0	0
34 "	@	0	5	=	0	14	2
195 "				=	£6	18	2

Dock charges, brokerage, &c.	0	11	6			
Agents' commission, post, &c.	0	5	0			
				0	16	6
Home charges :						
Barrels .. .. =	0	4	0			
Carting .. .. =	0	1	6			
Freight .. ... =	1	6	0			
Cutting and Packing =	0	3	0			
				1	14	6
				2	11	0
Profit				4	7	2
				£6	18	2

It is very desirable that there should be a reform in the nomenclature of fruits and trees, and that loosely applied names should be altogether dropped and correct names adhered to. Dr. Watt gives the following synonyms for *Citrus decumana*, pumelo, shaddock, pompelmos (or pampelmouse), forbidden fruit and paradise apple besides grape fruit. The Sinhalese name (which is commonly used in Ceylon) is *Jambola*, which has to be distinguished from Jamobalan, the Indian name for *Eugenia jambolana* also known as *Masan*. We cannot, however, fully agree with Professor Van Denan as to the pumelo being particularly "luscious" and (as he calls it in another place) "delicious."

It is the experience of many that nitrogenous manures encourage a rank sappy growth of wood in orange trees, and in young trees actually retard fruit bearing. What the tree mainly needs is potash, and if fruiting some phosphate also. This will furnish material for producing a moderate amount of wood and plenty of fruit. The point in orange growing is not to encourage too much annual growth, which if moderate and if plenty of potash and phosphate be supplied will keep the tree much healthier than if over supplied with nitrogenous fertilizers. Too free use of animal manure for oranges is therefore to be avoided.

In Jamaica the planting out of oranges and pumeloes in regular groves, budded from the best varieties, is being extensively done, and some of the groves of young budded trees are now beginning to bear. The export of oranges and pumeloes for the year ending 31st March, 1898, amounted to, oranges 88,013,091, value £134,673, against 99,691,900, value £123,715 this year, and pumeloes 8,989 barrels and 5,620 boxes, value £7,983 15*s.* 9*d.* against a value of £7,649 this year.

"If chloride of lime be spread on the soil or near plants, insects and vermin would not be found near them." By its means plants will easily be protected from insect plagues, by simply brushing over their stems with a solution of it, or sprinkling upon. It has often been noticed that a patch of land which has been treated in this way remains religiously respected by "grubs," while the unprotected beds around are literally devastated. Fruit trees may be guarded from the attacks of "grubs" by attaching to their trunks pieces of tow smeared with a mixture of hog's lard and chloride of lime, and ants and grubs already in possession will rapidly vacate their position. Butterflies again will avoid all plants whose leaves have been sprinkled over with this chloride of lime. Directions :—1 ounce of chloride to 8 of lard, ⅛ lb. of chloride to a pail of water.

Citrus trees require very little pruning. The first year should see them take proper shape, and if well cared for they will expand and develop symmetrically without much subsequent pruning. A little pinching back here and there as the tree starts off the first year is ordinarily sufficient. Make the trees head low and compactly. Don't put any ignoramus who professes to know it all, to butchering your trees as I have seen done recently, where a man went through a healthy, flourishing young grove, and left only skeletons behind, setting the trees back more than a year's growth and fruiting. If you do not know how to do it yourself, or cannot get a man of experience to advise you, you had better not prune at all, concentrate your energies on thorough cultivation and fertilizing, and the tree will do the rest.

MILK AND MILKING.

That the milk last obtained in the ordinary milking of a cow is much richer than that first drawn, is well known to all observant dairymen. We have in the Australian *Farm* a report of a Danish experiment, with judicious remarks about milking generally.

The experiment was made with milk drawn from a number of cows, and collecting the quantities of the different qualities as given below —

"1. Milk from the first streams, 172 lb., gave 1 lb. of butter.
2. Milk from the middle streams, 38 lb., gave 1 lb. of butter.
3. Milk from the last streams, 27 lb., gave 1 lb. of butter.
4. Milk from the last drops, 12 lb., gave 1 lb. of butter.

This shows that the after-milk is very rich in butter elements, and therefore very valuable.

Straining the cow's milking capacity to its utmost will develop the udder toward rendering as perfect service as possible.

The milking hours should be regularly kept and the cows milked in a fixed succession—if possible by the same hands. If the milking starts too early the animals are not prepared for it; if too late, they grow impatient, and may even suffer considerable pain. In either case the animals are sure to yield less milk than ordinarily.

Any inconvenience suffered by the milch cow will result in a loss of milk.

Any unusual condition of the udders and teats calls for immediate attention. Soreness of any portion, sores of a peculiar character, and obstruction of the milk ducts should be promptly treated.

Cows with diseased udders are likely to be affected with some contagious sickness, and should therefore be placed apart from the remainder of the herd. Their milk cannot be gathered in the same buckets and pails as are used with the other cows until health is restored.

Whenever a "hard milking" cow is found the narrowness of her milk canals may be obviated by rolling the teats between two hands. The passing of a straw into the milk canal is disastrous to the animal, and may cause inflammation of the udder. On being milked after the first calf, many cows are very sensitive to the milker's touch. Nothing but patience and gentle treatment will avail in such cases.

A dirty udder should be cleaned with warm water before milking and rubbed dry with a clean cloth.

Inflamed udders have been successfully treated with water as hot as can be borne by the hand, and applied frequently."—*Cape Agricultural Journal.*

AGRICULTURAL EDUCATION.

It has been the experience in all countries that Agricultural Educational establishments have serious difficulties to contend with at the outset. Practical agriculturists, and especially those who have been more or less successful cultivators, are always ready to serve at schools of agriculture; while the difficulty of securing a good attendance at classes, where no prospects of employment are held out to students, is another drawback.

The Principal of the Poona College of Science in a letter to the Director of Public Instruction, Bombay, says regarding the agricultural classes:—

I regret to have to report a very unsatisfactory state of affairs. While our new Engineering and Forest classes are so crowded this year, that I have some difficulty in providing room for them all, there is only one student in the new Agricultural class, *viz.*, a man who has been sent from the Central Provinces with a scholarship of Rs. 20 per mensem, and one extra or private student, a Parsee, in the Diploma class. In order to induce fresh men to join, I offered this year three scholarships of fifteen rupees, ten rupees, and six rupees, respectively, to men attending the junior Engineering class, if they would take up Agriculture instead; but only one man applied for the exchange, on the condition that he be given the first scholarship, so I did not accept the offer

The reason for the failure of these classes is, without doubt, the definiteness of their future prospect. The L. C. E. graduates never fail to get fairly remunerative posts, and the Forest Rangers can look forward to success, seeing a number of past students already employed in the Forest Department. But there have not been many instances of similar success among the Agricultural diplomates up to date. He also suggests that Government should annually publish in March or April the number and nature of appointments which will be gauranteed to students who obtain the diploma in Agriculture, and that the scholarships be reduced in number and raised in value.

A Government Resolution has been issued, stating: His Excellency the Governor in Council regrets that the Agricultural classes in the College of Science, Poona, are languishing for want of students. The state of things is the more deplorable, as by Government Resolution, Revenue Department, No. 2178, dated the 26th March, 1898, it was directed that holders of the diploma in Agriculture granted by the Bombay University under the revised Regulation shall rank with graduates of the University, and shall be allowed all the special privileges enjoyed by the latter in the matter of the admission to, and promotion in, the Revenue Department. Government understand that these advantages are not generally known. The Principal of the College of Science should, therefore, be requested to give as wide publicity as he can to such information as he considers likely to attract students to the Agricultural course. The proposed revision of the number and value of the scholarships attached to the agricultural classes is approved, and the Director of Public Instruction should be requested to notify the change to all Head Masters of High Schools, and call their attention to the chances of employment offered to men holding the diploma in Agriculture. The necessary action as regards suggestion (*c*) made by the Principal will be taken in the Revenue Department, which should be requested to forward a copy of the orders that may be issued to the Political Department for similar action as regards Native States in this Presidency.

After reading of this state of things in India, we consider the Colombo School of Agriculture has done well in keeping up its classes under the very trying circumstances in which it has been placed, with no incentives to students in the way of scholarships, no adequate funds for satisfactorily carrying on its work, and with the worst possible soil at its disposal for practical operations. And yet the Ceylon Government has not yet thought fit to adopt the initiative set by the Indian Government and offer suitable employment to students who have had an agricultural training.

NOTES ON EXHIBITS FOR PARIS.

1. Edible Birds' Nests.

Among the Exhibits being collected for the Paris Exhibition are some about which many persons know little, particularly as regards the origin of certain products which may be familiar enough in the commercial form. It has therefore

been suggested that a series of notes giving information with reference to these articles might prove of interest to our readers, though it will no doubt be found that a number of them are familiar enough to some persons though but little known to others and *vice versa*.

At present the collection received for transmission to Paris is not a very large one, but still there are a few exhibits which appear to be more or less unfamiliar to visitors, and about which the following notes will give them some information:—

The birds which construct the edible nests are found chiefly on the Pigeon Islands (North Canara), Vingorla Rock, and Sacrific Rocks, on the coast of Malwan (Ratnagiri District), at Tavoy and Mergui, and in the Andaman and Nicobar Islands. *C. nidifica* is known also to occasionally visit Darjeeling, Assam, and the Nilgiri Hills, and to breed on most of the islands on the coast of the Malabar and the Concan round the Bay of Bengal to the Burmese Coast and the Malay Peninsula. *C. linchi* is the principal species of Java, known locally as tintye. In most of the regions where these birds are found, there are caves which afford shelter and protection. These caves occur chiefly in limestone formations, and are often several miles from the coast; at other times they have to be entered by boats.

Mr. Portman, in his report of the Andaman Island Edible Birds' Nests, says:—"I have observed two kinds of swallows, both of which build in the caves. The larger bird has more white in his plumage, and builds a nest of twigs and grass, &c., glued together, and attached to the rock by a peculiar mucilaginous matter. The smaller bird builds a nest of white mucilaginous matter entirely, and it is this nest which is so much sought after. The nest is built in the form of a small bracket attached to the side or end of the cave, of a semi-circular form, with a radius of about 1½ inches, and regarding the matter of which it is composed opinions differ."

"In Borneo, from which country China obtains the majority of her birds' nests, the better qualities of nests are found in caves in the interior in crystalline limestone rock, only an inferior quality of nests being found on the seashore. These remarks apply equally to the Andamans; and I have no doubt that when the interior of the islands is explored, many more nest-yielding caves will be found. All our present knowledge is derived from the Malays, who, through fear of the Andamanese, did not dare to search the interior. The explorations should be confined to hilly country, where the crystalline limestone formation predominates.

The greatest difference of opinion prevails regarding the nature of the material of which the nests are formed. Early writers used to contend that they were made of a sea-weed which the bird collected for the purpose and chemically changed in some mysterious way. Ure (Arts, Manufactures, and Mines) says: "The nests are made of a particular species of sea-weed which the bird macerates and bruises before it employs the material in layers so as to form the whitish gelatinous cup-shaped nests so much prized as restoratives and delicacies by the Chinese. On the other hand, many recent writers discredit this theory and believe that the gelatinous material is either the natural saliva of the bird or a substance brought up from the stomach for the purpose and derived from the natural food of the nest, viz., insects. In support of this opinion they point out that the better qualities of the nests are found in caves far removed from the sea. Some of the nesting caves of Borneo are 140 miles from the sea. Mr. de Roepstorff points out that there are no edible nests in the Nicobar Settlement, but a few miles off in a richer tract of country where insect life abounds they are plentiful. "It is thus," he says, "in places where the food of the swallow is plentiful, that they exist under the most favourable circumstances, and where the nests are best." In the Ratnagiri District *Gazetteer* it is stated "the swiftlets breed in March and April, in caverns of the rocks, the nests being made of inspissated saliva, in the form of white gelatine, pure white when fresh, but when old brownish and mixed with extraneous substances." Mr. Portman remarks: "The swallow is supposed by some to make this matter, which resembles isinglass, from a species of sea-weed (fucus) resembling Carragen, an Iceland moss. I have often seen this sea-weed, but have never seen the birds on the sea-shore gathering it. Another theory is that the bird excretes this matter from his own throat during the breeding season." I am unable to give any decided opinion in the matter, but the natives have a theory that the birds bring it down from the sun."

(*To be continued.*)

PRINCIPAL FIBRES USED COMMERCIALLY.

By Dr. Chs. Richard Dodge.

Of the two dozen species of commercial fibres used in the United States, twenty figure in the list of imported raw products. Taking into account, also, the imported manufactures from fibrous substances and some of the rougher manufactures from fibres or fibrous substances produced at home, the complete list of American commercial fibres may be swelled to thirty species, many of these being unimportant. There are six bast fibres, as follows:—Flax, *Linum usitatissimum*, China Grass, *Boehmeria nivea* (including Rhea, *B. tenacissima*); hemp, *Cannabis sativa*; jute, *Corchorus capsularis* and *C. olitorius*; Sunn hemp, *Crotalaria juncea*, and Cuba bast, *Hibiscus teliaceus*; all excepting the last being spinning fibres, the Cuba bast finding employment in millinery. There are two surface fibres: Cotton, *Gossypium spp.*, and Raffia, *Raphia ruffia*. The list of structural fibres numbers 15, representing Agaves, palms, and grasses, as follows: Sisal hemp, *Agave rigida* (varieties); Manila hemp, *Musa textilis*; Mauritius, *Furcroya gigantea*, and New Zealand flax, *Phormium tenax*, cordage fibres; Tampico, or Istle, *Agave hetera cantha*; Bahia piassaba, *Attalea funifera*; Para piassaba, *Leopoldinia piass-aba*, Mexican whisk, or Brown root, *Epicampes macronra*, and Cabbage palmetto, *Sabal palmetto*, brush fibres; Crin végetal, *Chamae, rops humilis*; Spanish moss, *Tillandsia usneoides*, Saw palmetto, *Serenoa serrulata*; Coconut fibre, *Cocos nucifera*, upholstery and matting fibres;

Esparto grass, *Stipa tenacissima*, for paper manufacture and vegetable sponge. Luffa aegyptica, as substitute for bath sponges. The two species of palmetto and the Spanish moss for vegetable hair are wholly produced in this country. As to the sources of supply of these fibres, flax is imported chiefly from Belgium, Russia, Holland, Italy, the United Kingdom of Great Britain and Ireland, and from Canada. China grass or ramie comes from China (in small quantities). Hemp is derived from Russia, France, Belgium, Germany, Austria-Hungary, Italy, the Netherlands, and British East Indies (the latter in trifling quantity); jute from India, and Cuba bast from the West Indies. The imports of cotton are chiefly produced in Egypt and Peru, though small quantities may be derived from other countries. Raffia, used as agricultural tie bands, comes from Africa.

The sisal hemp supply is produced in Yucatan, small quantities being produced in Cuba and the Bahamas. Manila hemp is a product of the Philippine Islands, Cuba hemp being a trade variety. Mauritius or aloe fibre comes from Africa, and the source of supply of New Zealand flax is indicated by its name. Tampico, or Istle, is a Mexican product, and the Bahia and Para piassabas, or "bass" fibres, are collected from Brazilian palms. There are other species of bass (see Bass in Catalogue) derived from African palms, which formerly never came to the United States, and now, if at all, only in trifling quantities. Broom root is a Mexican product, the root of a tall, wiry glass. The two palmetto fibres are produced from uncultivated species of Florida palms, while the Crin végetal is derived from an allied palm growing in Algeria. The vegetable hair from Spanish moss is prepared in South Carolina and other Gulf States, while coconut fibre comes from the East Indies. Esparto grass is produced in Algeria, Spain, and Portugal, and vegetable sponge comes largely from Japan. Other commercial species that might be enumerated are imported in a partially prepared state or as manufactures. Such fibrous substances appear in the form of straw plait from Italy, Japan, and China chiefly, the eastern floor mattings and basketry from various substances. In this account, however, only the raw fibres are noted. The fibres produced in this country in commercial quantity are cotton, hemp, flax, palmetto fibre, and vegetable hair from Spanish moss. Hemp and flax production should be largely extended; jute production and the growth of sisal hemp, pineapple, and bowstring hemp are possible. Cane fibre can be produced in large quantities, and there are doubtless other kinds that might form the basis of local fibre industries. The paper materials other than Esparto are not considered in this category. The native fibrous substances that might be employed in lieu of cellulose from our forest trees, for paper pulp, would make a long list, at the head of which might be placed the waste fibre from a million acres of flax produced only for seed. A day is surely coming when the question of securing new pulp materials will present itself, and it is to be hoped that from the long list of native species of fibrous plants enumerated in this work something will be found that will supply at low cost a better paper material for common use than wood pulp, which has nothing to recommend it but availability of raw material and cheapness.

THE PROGRESS OF AGRICULTURAL CHEMISTRY.

The following is taken from an account of Prof. Maercker's address before the German Chemical Society, and gives his views with reference to Plant Food, Soils, and Manures, subjects of so much importance to agriculturists:—

In supplying nourishment to plants we must know what substances are necessary, and in what form and quantity they should be provided. Little progress was made in our knowledge of the subject till the quite recent introduction of the method of water-cultures of Sachs, Knoop, and Nobbe and the method of sand-cultures of Hellriegel permitted of the conduct of experiments in pure media, and thus rendered it possible to ascertain not only what substances are essential for plant life, but also the part played by each substance in the plant cell. Thus we know now that phosphoric acid is essential for the formation of nitrogenous substances in the plants, because the albumens, which are of fundamental importance in the transformations of substances in plants, result from an intermediate phosphoric acid compound, as is indicated by the regular occurrence of lecythin in protoplasm. Again, iron is an essential constituent of chlorophyll and sulphur of albumen, and hence must be supplied to plants. The true function of calcium was for long doubtful; its action is now known to be of a medicinal character, since it serves to neutralize the poisonous oxalic acid, which is always an intermediate product of the oxidation of the carbohydrates. It was formerly thought that calcium fulfilled some important function in the leaves, being chiefly found in the foliage of plants. Since, however, the leaves are also the chief seat of the oxalic acid, this distribution of the calcium is easily explained.

The part played by potassium has only within the last three years been explained by Hellriegel, who, by exact experiments with beet-root, showed that the amount of sugar in the beet stands in close relation to the amount of potassium provided for the plant. P. Wagner has made the interesting observation that the potassium may be partly replaced by sodium.

The exact value of magnesium to plants is not yet well understood, but it appears to be of importance in the formation of the nitrogenous substances of seeds, as in these considerable quantities of magnesium phosphate occur,

Nitrogen is an indispensable plant-food, for it is an essential constituent of albumen.

In addition to the quantities of mineral substances required by plants to enable them to exhibit a healthy growth, further quantities are found to be essential to satisfy what has been termed, though not very aptly, the "mineral-hunger" of the plant. This is best explained by an example. E. Wolf found that for the production of 100 parts of oat-plant (dried), ·5 parts of phosphoric acid was necessary, when the remaining mineral substances were supplied in excess to

the plant. By other similar experiments he showed that the following quantities of mineral substances were necessary for the production of 100 parts of oat-plant:—

Phosphoric acid	·50 parts
Potash	·80 „
Lime	·25 „
Magnesia	·20 „
Sulphuric	·20 „
	1·95 parts

A total of 1·95 parts of mineral substances is therefore necessary in the case of the oat-plant. However, there is no oat-plant in nature which contains so little as 1·95 per cent. The minimum is 3 per cent. The difference, 1·05 per cent, is the measure of the "mineral-hunger" of the plant, and represents the mineral substances which does not perform any special function. This excess of mineral substance may be supplied in the form of some indifferent substance, such as silica. The observation is of considerable interest to the farmer, for it shows that it is not economical to manure crops with pure substances.

Having ascertained in general what substances are necessary as plant-food, the agricultural chemist has next to apply this general information to the manuring of soils which are more or less deficient in certain ingredients. It has been found, unfortunately, that the chemical analysis of a soil is of little use as a guide unless accompanied by what may be termed a "mechanical analysis," by which he meant chiefly a determination of the amount of finely-divided constituents present in the soil. It is only the finally divided earth which presents a sufficiently large surface for the exercise of the solvent action of the water and its dissolved carbonic acid. There is one case, however, in which chemical analysis alone is of the greatest importance, *viz*, when only traces of some necessary element are present in a soil. Here there is no qustion of the need for a manure containing this substance.

If, on the other hand, large quantities of an element are present, it does not follow that there is a sufficiency in the soil even when the latter is in a satisfactory state of division, for the substance in question may be present in an insoluble or refractory form. This is commonly the case with nitrogen, which exists in the soil chiefly in the form of a mixture of indefinite nitrogenous substances known as humus or mould. These substances sometimes easily give up their nitrogen to plants, but in other cases are very refractory. The uncertainty as to their action is indeed so great that certain peaty soils are known which consist almost entirely of humus, but contain, nevertheless, an insufficiency of available nitrogen.

Phosphoric acid affords another illustration. The soluble phosphoric acid of the manure is absorbed by the soil as dicalcic phosphate, which is comparatively easily soluble in the soil-water. With time, however, it may change in the soil to the insoluble tricalcium phosphate, or even to iron or aluminium phosphates, which are still less soluble.

In the case of calcium, chemical analysis has been found to be of considerable service in determining what manuring is required, since calcium is chiefly valuable in the form of carbonate or humate, and these are easily estimated in the soil.

Since then the direct method of soil-analysis is an insufficient guide to manuring, it is fortunate that chemists have been able to develop successfully an indirect method. This is the cultivation method, by which plants are allowed to grow in the soil under examination, after taking care to provide a sufficiency of all plant-food stuffs except the one, *e.g.*, phosphoric acid, whose presence in available form is being tested. The plants are then analysed, and the results compared with the analyses of the same plants grown on soils provided with all the necessary plant-food stuffs. As an inportant result of the method it has been found that different plants take up very different quantities of the same mineral substances. On this is largely based the system of rotation of crops, where the second crop is so chosen that it chiefly removes the ingredients of the soil which have been left by the preceding crop.

With the aid of the cultivation method it has also been possible to draw up the following table which represents the relative values of the different nitrogen compounds for plant food.

Nitrogen of Saltpetre	100
„ „ Ammonia	85-90
„ „ Albumen	60

This table may be made use of in determining the nitrogen value of a manure.

The cultivation method may be used for testing the value of manures of all kinds. Thus it was by a few cultivation experiments that Wagner in Darmstadt first showed the very great value for agricultural purposes of the "Thomas" Slag, produced as a bye-product in the manufacture of iron by the basic process of Thomas Gilchrist. The million tons of phosphate meal annually produced in Germany is now wholly utilised by the agriculturist, and its preparation for the farmer has become an important offshoot of the industry.

Similarly the demonstration by the cultivation method of the value of potash salts in manures has given an enormous impetus to the potash industry.

Speaking generally, the method gives us complete control over the fertility of a soil in so far as this depends on manuring. One consequence of this has been that our views as to the value of agricultural land have completely changed, for whereas formerly sandy soils were generally considered poor, they are now by means of a system of intelligently directed manuring, made to give yields which are scarcely inferior to those of the best soils. The beet-sugar industry, which formerly could only be conducted in the best soils, has now been extended with marked success to sandy soils.

AGRICULTURAL EDUCATION IN FRANCE.

The system of agricultural education in France is reported to be most perfect, and just at this time when a Commission is sitting with reference to the question of establishing a Department or Board of Agriculture for the island, an account of the French system of agricultural education should prove both interesting and instructive reading.

We have just received, through the courtesy of a high official, a copy of a Report (only the series of Diplomatic and Consular Reports) on this very subject, written by Mr. H. Austin Lee, Commercial Attaché to Her Majesty's Embassy at Paris. From it we learn that though various efforts in the direction of agricultural education were made in France during the latter half of the eighteenth century, it was not until 1822 that the first agricultural school was founded by Matthieu de Dombastle, at Boville, near Nancy. This school was quickly followed by others: in 1829 by that of Bella at Grignon, one of the most flourishing institutions of the present day, and in 1830 by that of Riffel at Grandjonan. The introduction of the present system of agricultural education, however, dates from 1875-76. When Minister of Agriculture, Monsieur Meline, in his official report published in May, 1898, advocated the institution of a "Superior Council of Agricultural Education," which was organised by the decree of May 27th, 1898. It is charged with the supervision of all institutions, &c., affording agricultural education, founded or subsidised by the Ministry of Agriculture, and has a voice in all matters relating thereto. It meets at least once a year and forwards a report to the Minister of Agriculture, comprising its views respecting improvements to be introduced into the system as a whole. Of this Council of thirty, fourteen officials, including the officers in control of the various sections of the Agricultural Department, heads of the Veterinary, Forestry, Irrigation Departments, Directors of Forestry and Agricultural State Schools and Presidents of Agricultural Societies, are ex-officio members. The rest of the members are nominated from amongst the agricultural and scientific notabilities of the country and others. They are appointed for four years, one-half of their number being renewed every second year. Fifteen members of the Council form a permanent Commission which meets to consider urgent matters whenever summoned by the Minister of Agriculture.

The inspection of agricultural education has also been lately organised. There are now officers known as Inspectors-General and one inspector for each of the eight districts into which the country has been divided.

The Inspectors-General are charged with the organization of the general agricultural show at Paris, the supervision of district agricultural shows, and the inspection of the "Institute Agronimique" and the National Agricultural Schools.

The Inspectors are charged with the supervision of the establishments affording agricultural education in the general districts other than the abovementioned, with that of the departmental and special professors. They also organise and preside over the district shows. They are subordinate to the Inspectors-General.

The corps of inspectors are recruited from qualified professors of various agricultural institutions.

The State expenditure on agricutural education, under this system, is, as may be expected, considerable. The votes for National Institutions aggregate £77,434, and for institutions subsidised by the State £75,026, or a total, for the year 1899, of £152,460. The receipts from fees and sale of produce in general establishments, giving as the figures for 1897, are between £12,000 and £13,000

Agricultural education as it exists in France may be divided into four sections, viz., Elementary, secondary, higher and general.

Under elementary agricultural establishments are classed (*a*) the Farm Schools, and (*b*) the Practical Agricultural Schools.

Of Farm Schools there are fourteen at present, though at one time there were about five times this number. The decrease is attributable, firstly, to the increase of "practical schools," and secondly, to the growth of private establishments taking paid apprentices. But though their present importance is comparatively small, it would appear that these Farm Schools still supply a distinct want. These institutions can scarcely be called schools. The farm is a private speculation. The Government pays the salaries of the staff of teachers, 7½d. per day towards the upkeep of each apprentice, and gives usually a bonus of £12 on leaving to those who gain their diploma, and £8 to those who do not. The teaching is gratuitous, the apprentices are boarders, and the course varies from 2 to 3 years. The age of admission varies from 14 to 16, and the average number of apprentices is about 20.

The staff usually consists of a Director, a teacher, superintendent (who is also accountant), a gardener, nurseryman, overseer of practical work and Veterinary Surgeon and drill master; besides special instructors for any special local cultivation. The teaching is mainly practical, and the Director makes use of the services of the apprentices as he deems advisable.

The theoretical studies, which occupy about one-third of the time, are of a very elementary character. They include the revision of subjects taught in the elementary schools, horticulture, arboriculture, and general notions respecting surveying and levelling, agriculture in its widest sense, "first aid" to sick animals, and book-keeping.

Admission is obtained by examination in primary subjects, but those holding the primary education certificate are exempted from examination.

The objection that has been brought against these schools is that the Directors (who are the owners or lessees of the farm) are often apt to look upon the apprentices somewhat in the light of labourers placed at their disposal by the State, and to make them work merely with a view to their own ends, the question of teaching taking only a secondary place. A shepherd's school on the same principle exists at Rambouillet.

The practical agricultural schools may be said to fill a gap between the national schools, intended to give a secondary practical and theoretical education to the sons of larger landed proprietors, and the farm schools intended to give almost entirely practical teaching to the sons of labourers, They were established with a view to catering to the important peasant proprietors and small farmer classes.

These schools may be defined as farms of the better class, carried on with a view to profit, taking paying pupils who are taught the theory and practice of the special types of agriculture in the district of each school. The plan would appear to be successful for the number of these institutions existing, viz., over 40.

The object of these schools is stated to be "to take the child as he leaves the primary or superior primary school, to give him thorough practical and theoretical training, and then to send him back to the agricultural family, which he will not again leave." The practical school does not pretend to make finished agriculturists, but furnishes them with the means of becoming so by giving them a solid foundation of essential agricultural knowledge. The scheme devised for these schools has the merit both of simplicity and of economy to the State. The Director is either proprietor, tenant, or manager for some company department, or commerce. In the two latter cases he usually undertakes the farming at his own risk against an almost nominal rent. The initial cost of adapting the *farm* for the purposes of a school is borne—except in rare instances—by the proprietor or lessee alone or in conjunction with the department. The owner, however, often provides the whole of his cost, being repaid by the department by annuities. The State is in no way concerned with such matters, nor participates in the management or the agricultural venture. When the school is founded with the sanction of the Minister of Agriculture, the Government undertakes to provide the salaries of the Director and staff, a small sum for general expenses, and usually from £100 to £200 for Scholarships, some of which are, as a rule, also offered by individual departments.

The average course of study is 2 years, the average number of students 30 to 40.

The average fees are £20 for boarders, £10 for half boarders, £2 for day scholars. The scale of charges is fixed by the Minister of Agriculture. If qualifying and where needed a competitive examination precedes admission; a certificate of elementry education exempting from examination. The direct supervision of each school is in the hands of a committee of officials and unofficials. The staff usually includes a director, three professors, a teacher-superintendent, Veterinary Surgeon, overseers for Agricultural, and horticultural work, and Military superintendent.

The pupils receive theoretical and perform manual labour alternately morning and afternoon; the practical portion of the tuition being supplemented by numerous excursions, which give occasion for object lessons in agricultural matters.

Whilst there is much diversity in the practical training, the theoretical tuition is of a fairly uniform type, including:

1. Agriculture, zootechnics (the study of the habits and characteristics of the different kinds of live-stocks, and then classified according to age, race, &c.) rural legislation and economy, and rural engineering.
2. Physics, chemistry, technology, and meteorology.
3. Botany, zoology, geology, horticulture, entomology, and the study of useful and harmless insects.
4. Superior primary instruction, civil law. mathematics, surveying, levelling, and book-keeping.
5. Hygiene and "first aid" to animals.

A weekly examination is held in each subject, and pupils are practised in laboratory and the work of the microscope.

We are then given a short sketch of two typical practical schools, viz., those at Berthonval in the North, and Ondes in Southern France.

The average cost to the State of Practical Agricultural Schools would appear to be between £800 and £1,000. A certain number of schools afford instruction of a special character, such as the manufacture of cheese and butter. Poultry Farming and Horticulture, *e.g.* the Practical School of Poultry Farming at Sanvic, near Havre, and the Milk Industrial School at Poligny.

Here we close our review of this interesting report, reserving our notice of secondary, higher and general agricultural education in France for future issues.